TECHNOLOGY DEPT.

Gas Journal

Vol. 264 102nd Year. LONDON, DECEMBER 13, 1950. No. 4567. Price 1/-

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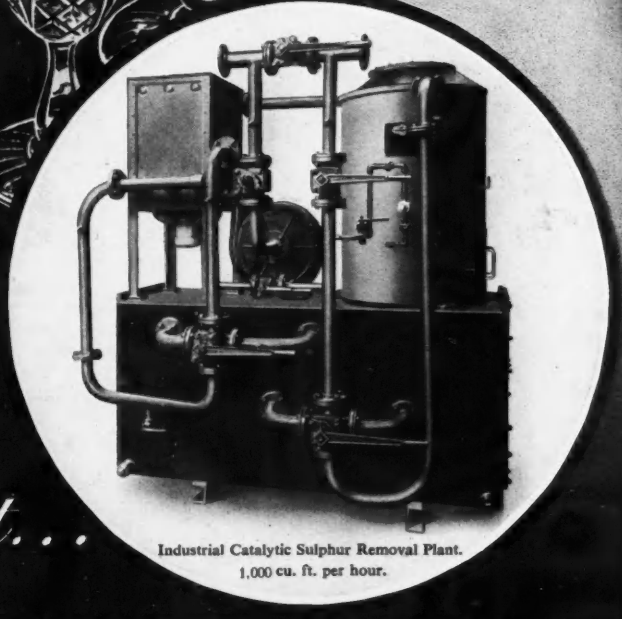

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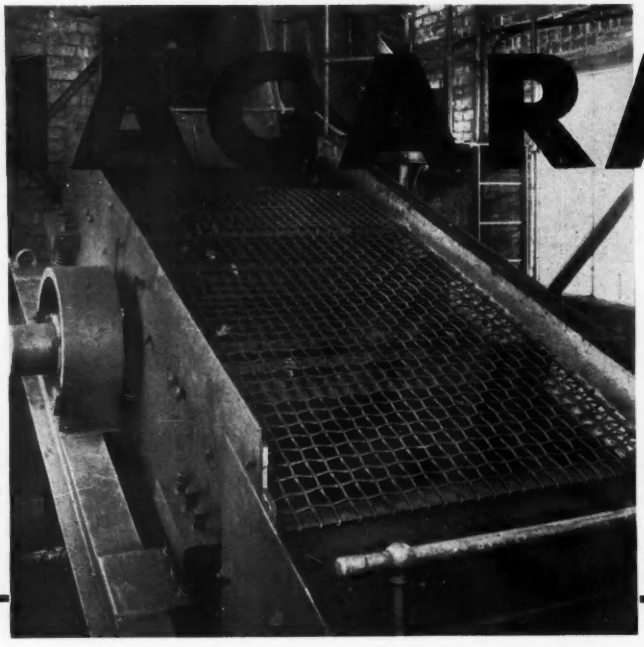

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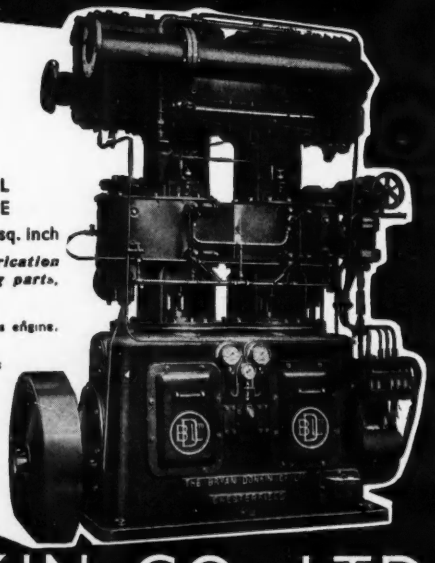

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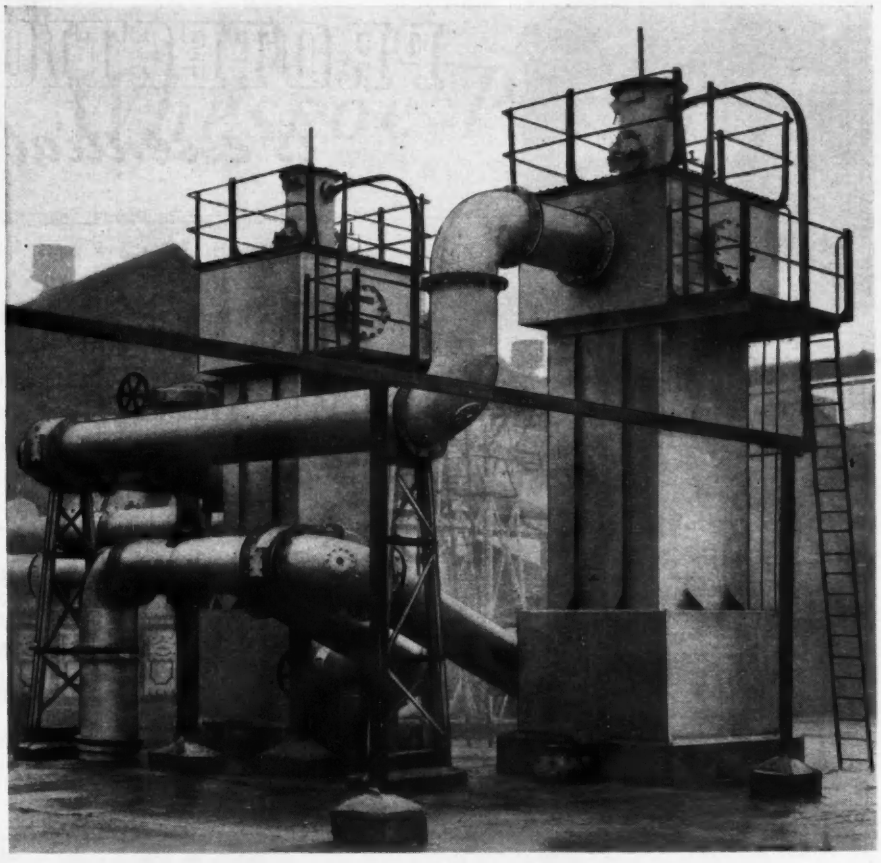

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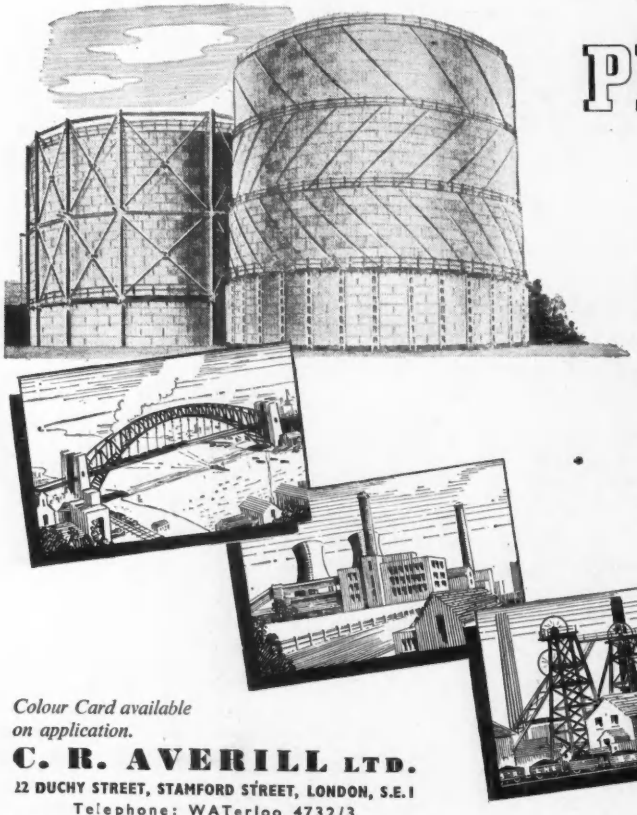

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GAS METERS

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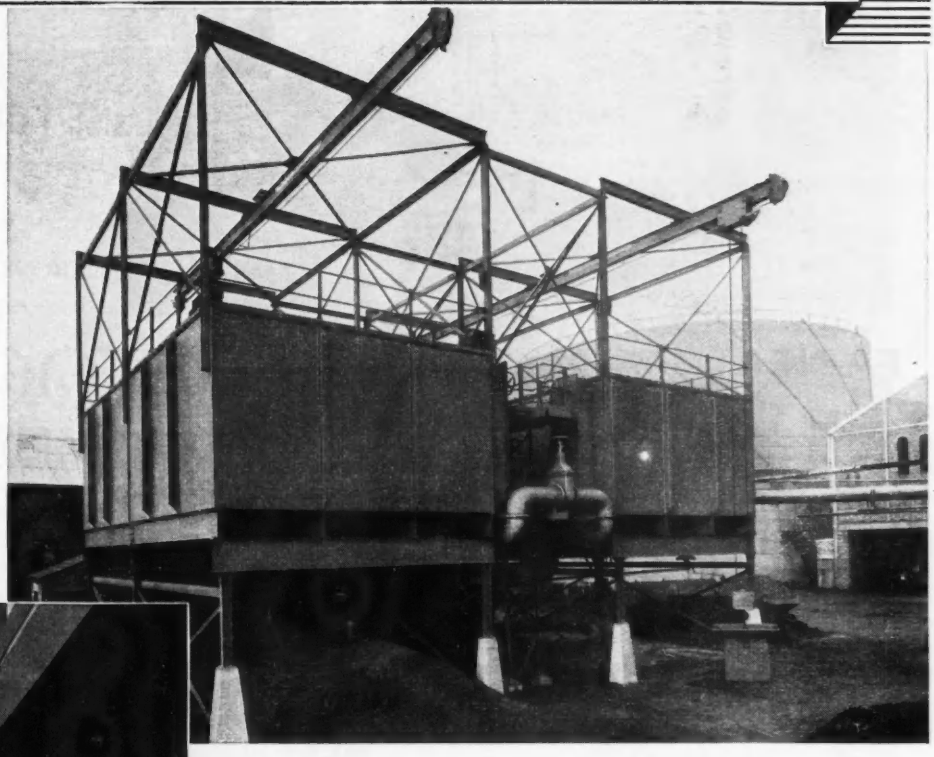
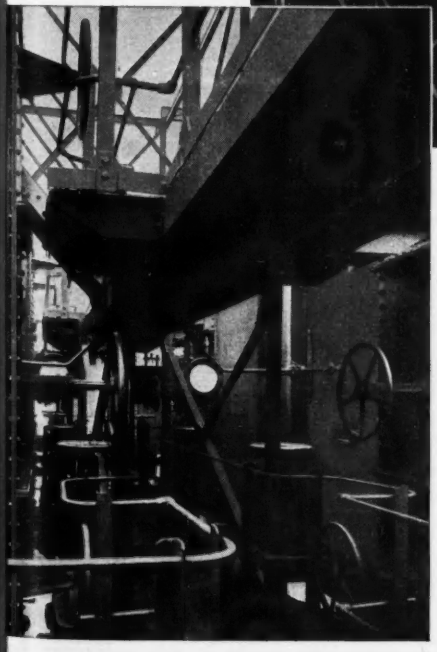
Whessoe Purifiers





The illustrations show a 4-box set of Whessoe purifiers, each 18 ft. x 18 ft. x 10 ft., with a capacity of 1½ million cu. ft. per day, for the Ormskirk Undertaking of the N.W. Gas Board.

This is a simple installation with modern features—deep, welded mild-steel, overground boxes, with divided and reversible gas flow. Simple and efficient charging is provided by Morris 3-ton skips, operated by pulley-blocks, with hoisting and traversing controlled by an electrically driven winch, which is also arranged to provide for cover-lifting.

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..at the Point of Sale

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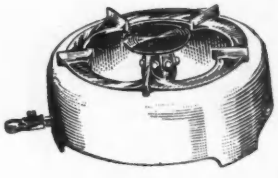
FA-NEAT GAS COOKING RINGS

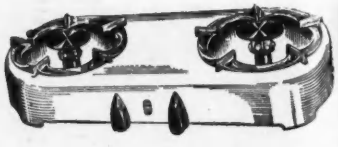
The two distinct types of FA NEAT gas cooking rings both employ the same kind of burner. This consists of a central member fitted with eight Neat jets. These burn gas and air at the point of combustion and provide control from boiling to simmering without lighting back. They are silent, and have single point adjustment.



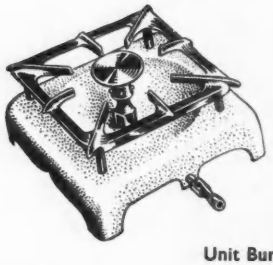
Hotplate FA/1

These handsomely styled appliances incorporate one or two rings respectively. The main structure is pressed steel, vitreous enamelled in grey or cream, with a light alloy pan support ring which is removable to facilitate cleaning.

These models are specially designed for domestic use, and are particularly suitable for dwellers in flats and bed-sitting rooms.

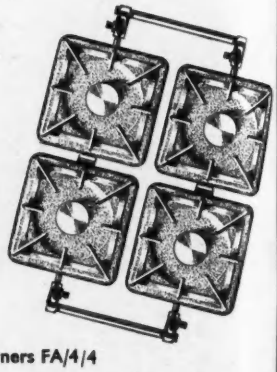


Hotplate FA/2



Unit Burner FA/4

This square type has the advantage that units can be added to make up two, three, four or more burner cookers by using a simple coupling with independent tap controls. It is sturdily constructed and will stand up to hard and continuous use. Quickly dismantled and easily cleaned, this unit burner is invaluable in the house and in canteens, hotels, restaurants, clubs or any place where hot foods and drinks are required quickly and in quantity. The standard finish is grey mottled vitreous enamel.



Unit Burners FA/4/4

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Manufacturers and Sole Distributors:

ASCOT GAS WATER HEATERS LIMITED

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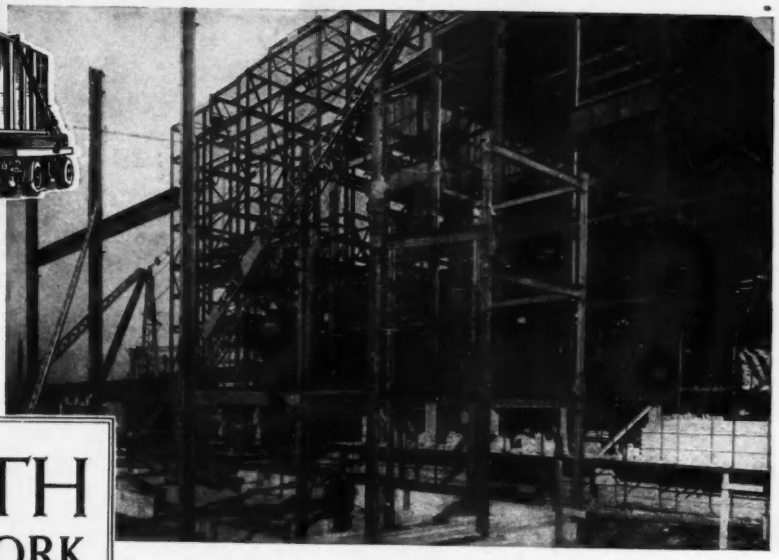
prelude to permanence •••



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Illustrated is a portion of a project which required riveted and welded steelwork. Both types were fabricated and erected by BOOTH, BOLTON.

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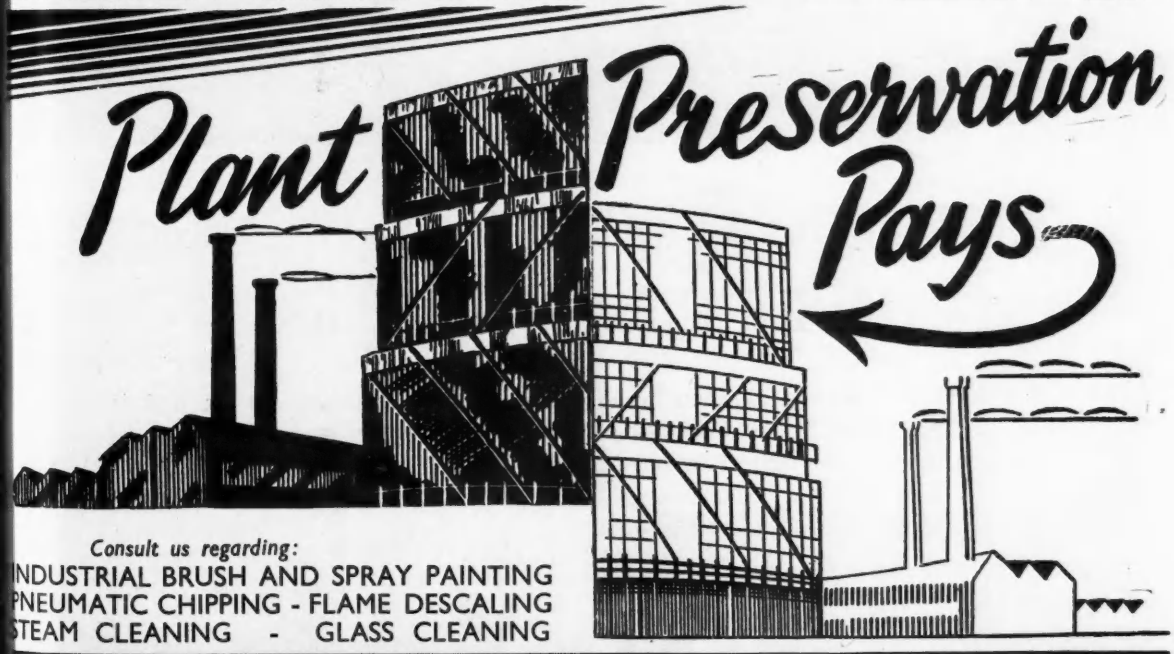

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These Tubes are soldered to the end plates by Alcho-re Cored Solder Wire Rings. The advantages of this method are: firstly, the use of solder rings facilitates correct positioning in the jig which is necessary to prevent the parts moving; secondly, the flux in the core of the rings is specially prepared for rapid penetration and is absolutely non-corrosive.

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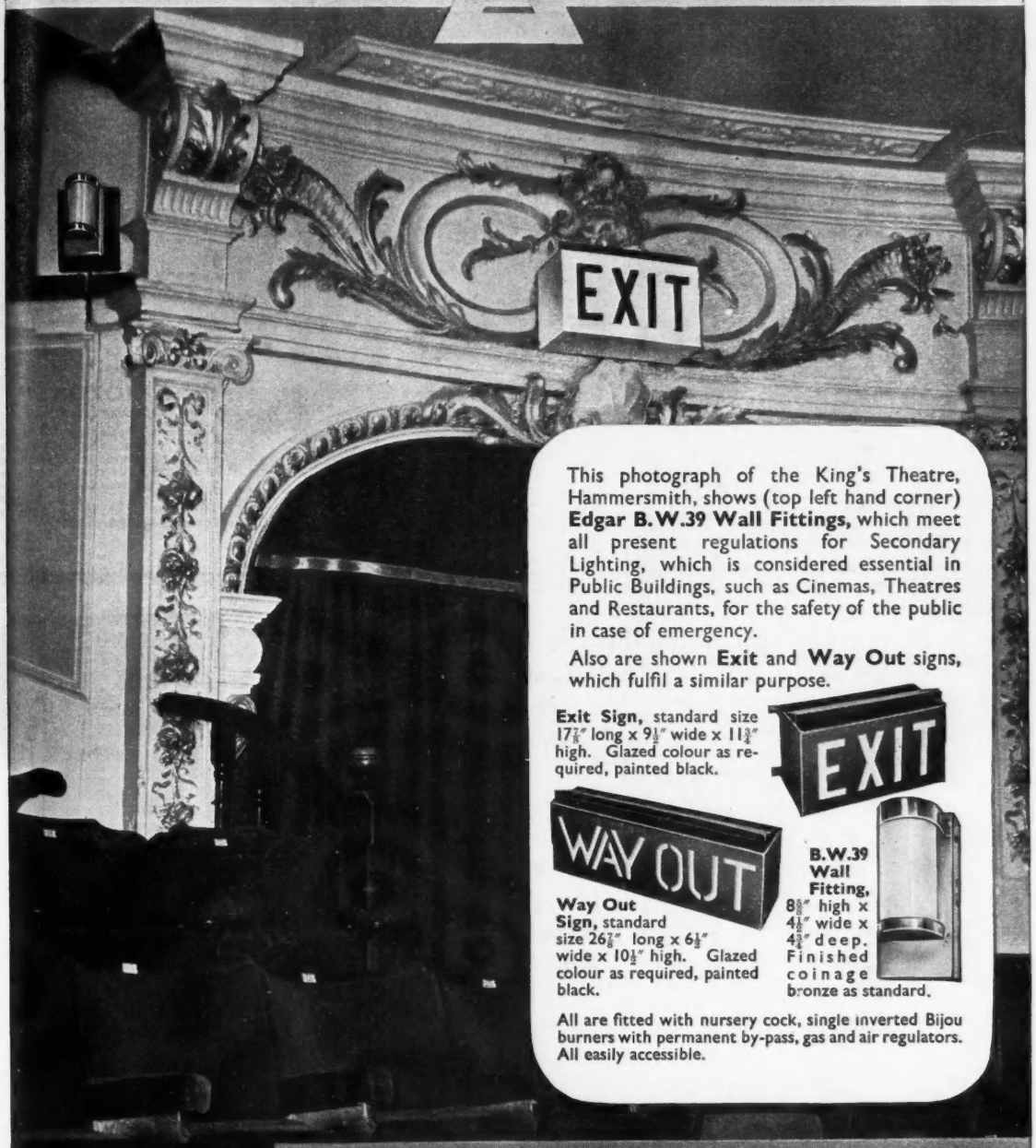

This photograph of the King's Theatre, Hammersmith, shows (top left hand corner) **Edgar B.W.39 Wall Fittings,** which meet all present regulations for Secondary Lighting, which is considered essential in Public Buildings, such as Cinemas, Theatres and Restaurants, for the safety of the public in case of emergency.

Also are shown **Exit** and **Way Out** signs, which fulfil a similar purpose.

Exit Sign, standard size 17⅞″ long x 9½″ wide x 11¾″ high. Glazed colour as required, painted black.

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B.W.39 Wall Fitting, 8⅜″ high x 4½″ wide x 4¾″ deep. Finished coinage bronze as standard.

All are fitted with nursery cock, single inverted Bijou burners with permanent by-pass, gas and air regulators. All easily accessible.

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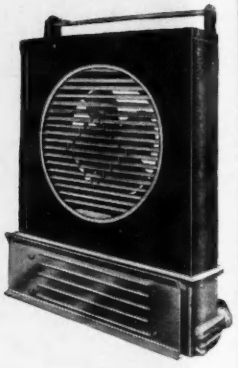

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Ready for use in one minute from lighting up. Saves fuel. For grilling, toasting, browning, etc. Finished in vitreous enamel and complete with silent motor fan set and gas governor. Well over 1,000 of these Salamanders are in use in leading hotels and restaurants.

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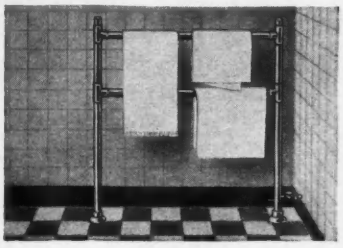
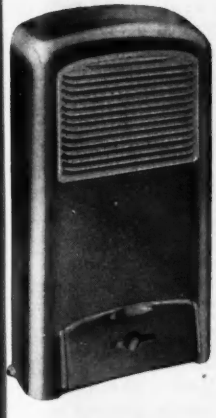


MILLITHERM TOWEL RAIL

This handsome, chromium plated gas heated towel rail has a small quantity of water in the tubes and operates like a miniature central heating system. Burning 1 cu. ft. of gas an hour, this towel rail can be kept alight day and night, with low cost of 10d. a week. Think of it — an efficient domestic towel drying unit maintained at a cost of one penny for 16½ hours



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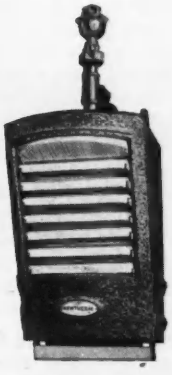

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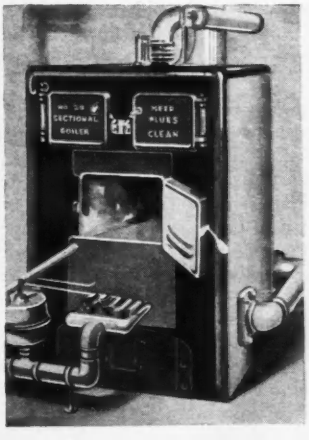

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Duoflam Conversion Burners (for low pressure gas) are a definite economy, developing much greater efficiency than the average type of gas burner. 500 different standard sets in stock.

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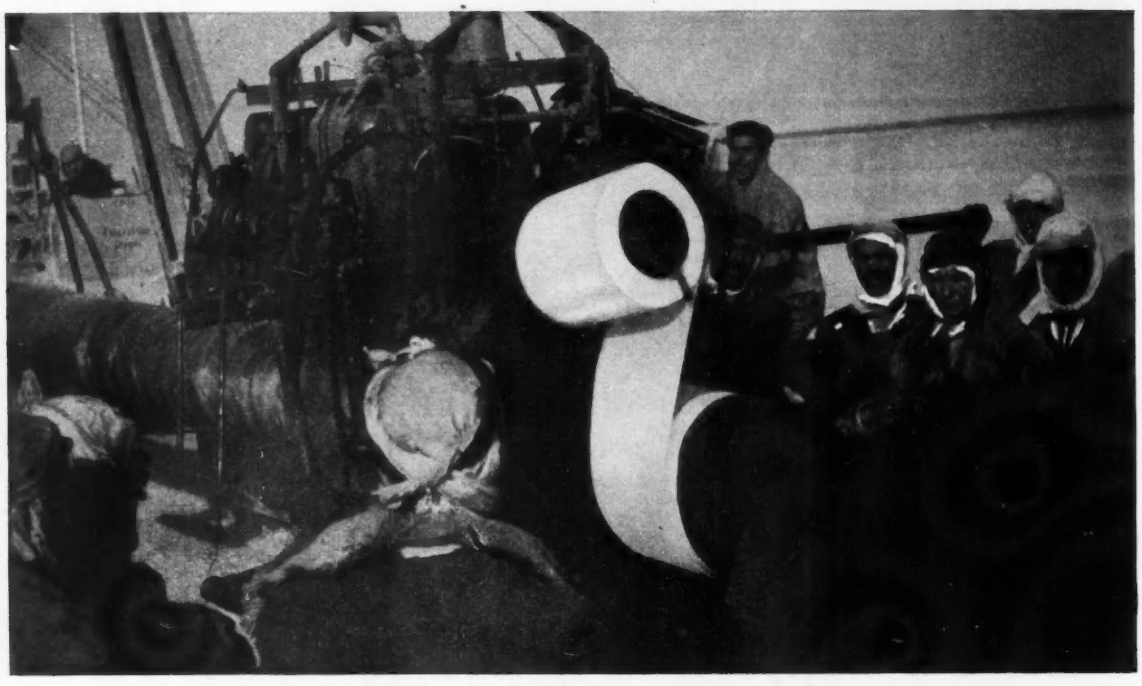

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THE MATERIAL 'Fibreglass' is fine-quality glass drawn into flexible fibres of high tensile strength.
In 'Fibreglass' Staple Tissue the fibres are bonded to form a thin, pliable tissue with special advantages in pipe wrapping.

ITS ADVANTAGES Staple Tissue possesses uniform porosity which allows rapid and even penetration and complete impregnation with bitumen. It thus adds to the effectiveness of the coating, allows the bitumen to spread evenly, eliminates all air pockets and gives complete adhesion to the surface in pipe wrapping.
It is rotproof, fireproof, acid resisting; is unaffected by bacteria, fungoid growths, organic solvents and soil acids; and has the high electrical resistance which is very important in pipe wrapping.
The construction and the arrangement of the non-cellular fibres in Staple Tissue mean that no oils are wicked from the bitumen and ensure a longer life for the coating.
Since 'Fibreglass' Staple Tissue cannot absorb moisture it does not swell or shrink with humidity changes, so a 'Fibreglass' wrapping means no loosening of the covering from moisture attacks.
It is easily applied and light in weight. Its lightness allows it to be supplied in longer rolls than other materials used for the same purposes and the length of the rolls saves time and labour in application as fewer stops and joins have to be made.
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Staple Tissue is suited to both methods of wrapping—and takes bitumen at a temperature of 450°F without turning a glass hair!

STAPLE TISSUE WRAPS THE PIPELINE Some 15,000,000 square feet of 'Fibreglass' Staple Tissue have already been used for oil pipelines in the Middle East. The above photograph shows a length of oil pipe in process of being wrapped.

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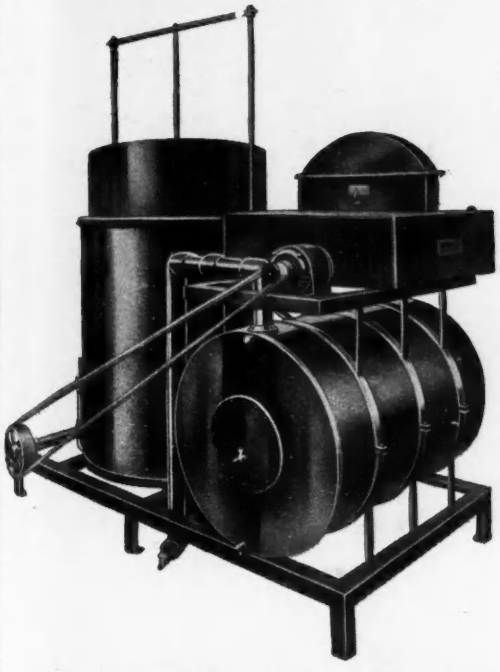
AEROGEN GAS GENERATORS



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Outputs of Plants Range from 100 Cubic Feet to 5,500 Cubic Feet per hour

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"Solid-top" gas ranges

Benham "Solid-top" gas ranges are composed of single units, which can be joined together to form ranges of any desired size, either as a wall or central pattern.

□

Their design provides a continuous solid-top cooking hot-plate, which can be controlled from simmering temperature to cherry red.

□

Ranges may be fitted with three types of hot plate burners as required, i.e., Three ring plate burner with "areomatic" non light-back injector.

"Chef" burner with "areomatic" non light-back injector.

Four open-flame burners.

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Solid-top range comprising two units.

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The Matchless Lighter

The Newbridge Gas Cooker Lighter is renowned for its reliability and ease of operation. It can be readily attached to all gas cookers.

GAS COOKER LIGHTER

The HORSTMANN GEAR CO. LTD.

NEWBRIDGE WORKS, BATH, ENGLAND. TEL: 7241

Automatic control of C.W. gas plant

Lockheed high-duty cylinder and interlock control.

Lockheed hydraulic equipment for actuating C.W. gas plant is being used to a rapidly increasing extent.

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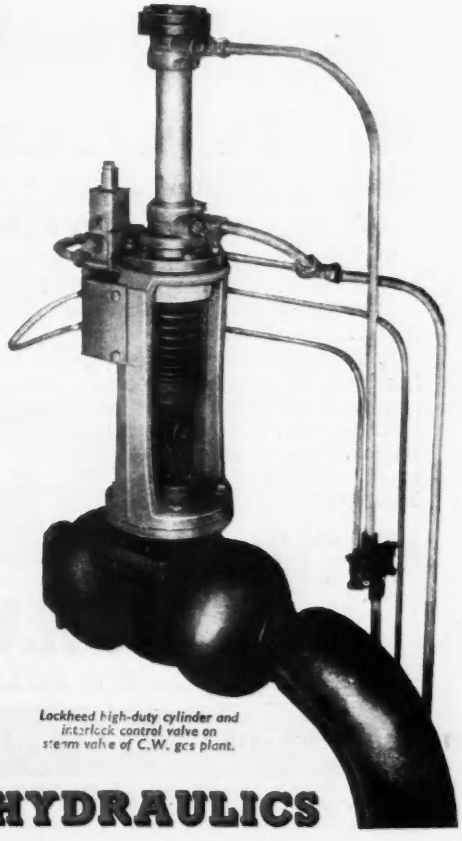
This plant—with a total daily productive capacity of 18,000,000 cu. ft. of gas, will have automatic cyclic control by the P.G.C. oil-hydraulic system, with Lockheed equipment operating at pressures up to 1,000 p.s.i.

The single-camshaft controller, with double cams for each control valve, can be adjusted to vary both the duration and make-up of the gas-making cycle. Synchronising equipment is provided to keep the plants in step.

Lockheed hydraulic equipment can be used to operate, either by power or by hand, any remote controls, with a high degree of accuracy and with the absolute minimum of maintenance.

Enquiries are invited.

AUTOMOTIVE PRODUCTS COMPANY LIMITED, LEAMINGTON, SPA



Lockheed high-duty cylinder and interlock control valve on steam valve of C.W. gas plant.

Lockheed
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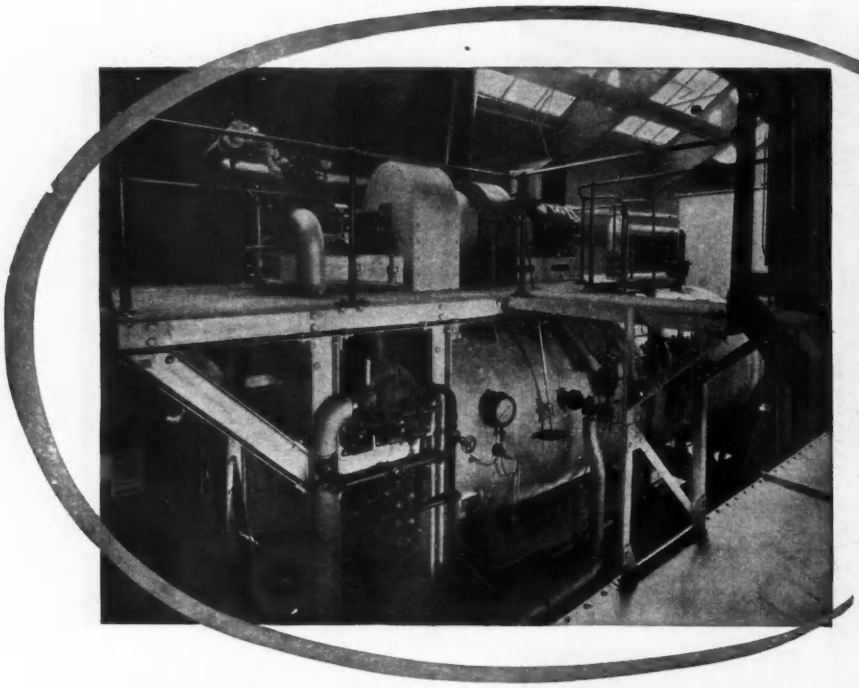

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The *NEW* WILKES

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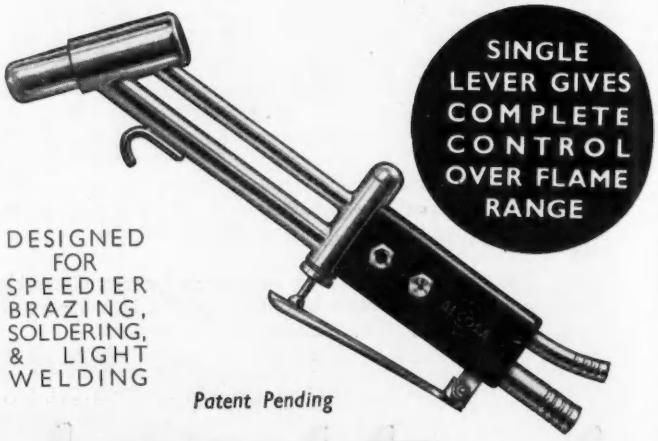
The finest Gas and Air Brazing Blowpipe ever produced—setting a new high standard in Blowpipe design. Sturdily constructed of highest grade materials.

Body and all units of best quality brass, heavily chromium plated, specially moulded handle fitted with two alternate jets. Operates with a minimum air pressure of approx. ½ lb. and normally of about 1 lb. per sq. in. Operates on town gas at approx. 3 in. water gauge.

Fully illustrated Folder No. BL209 will be sent on request.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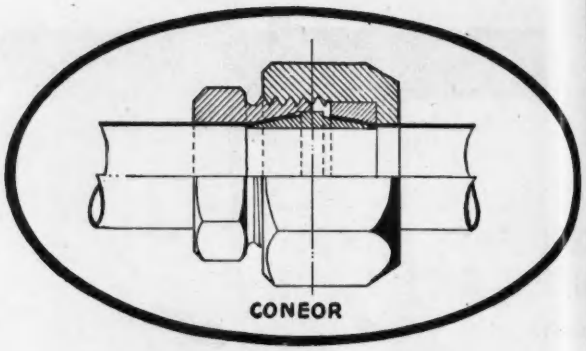

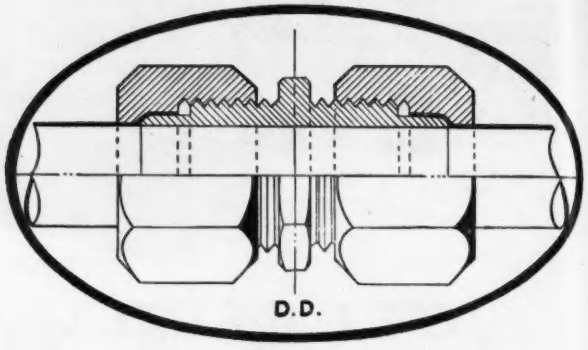

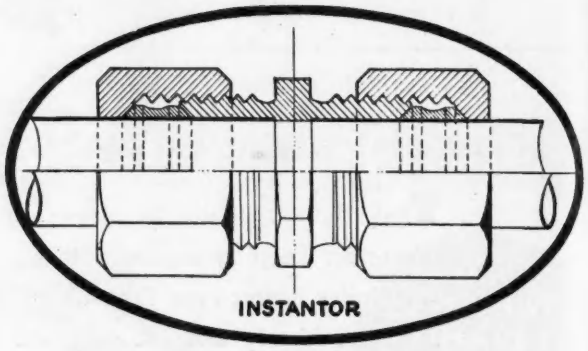

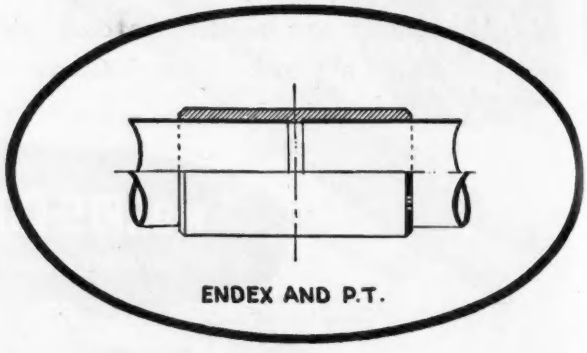

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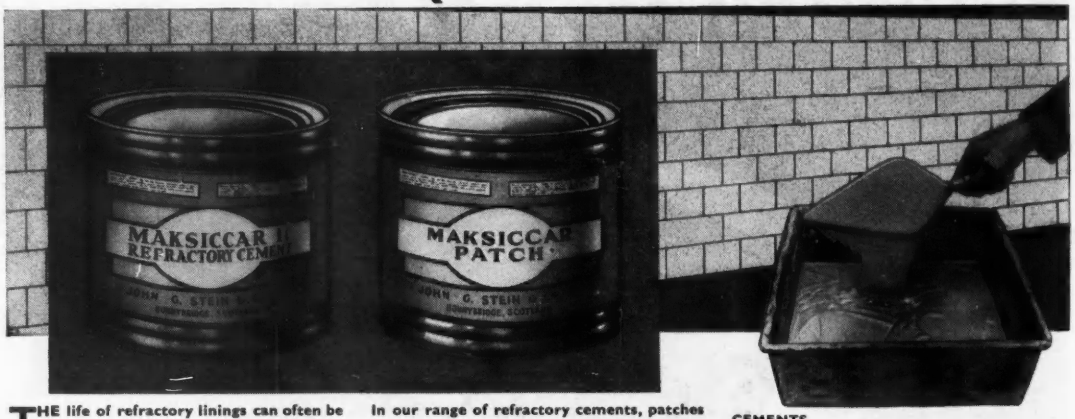

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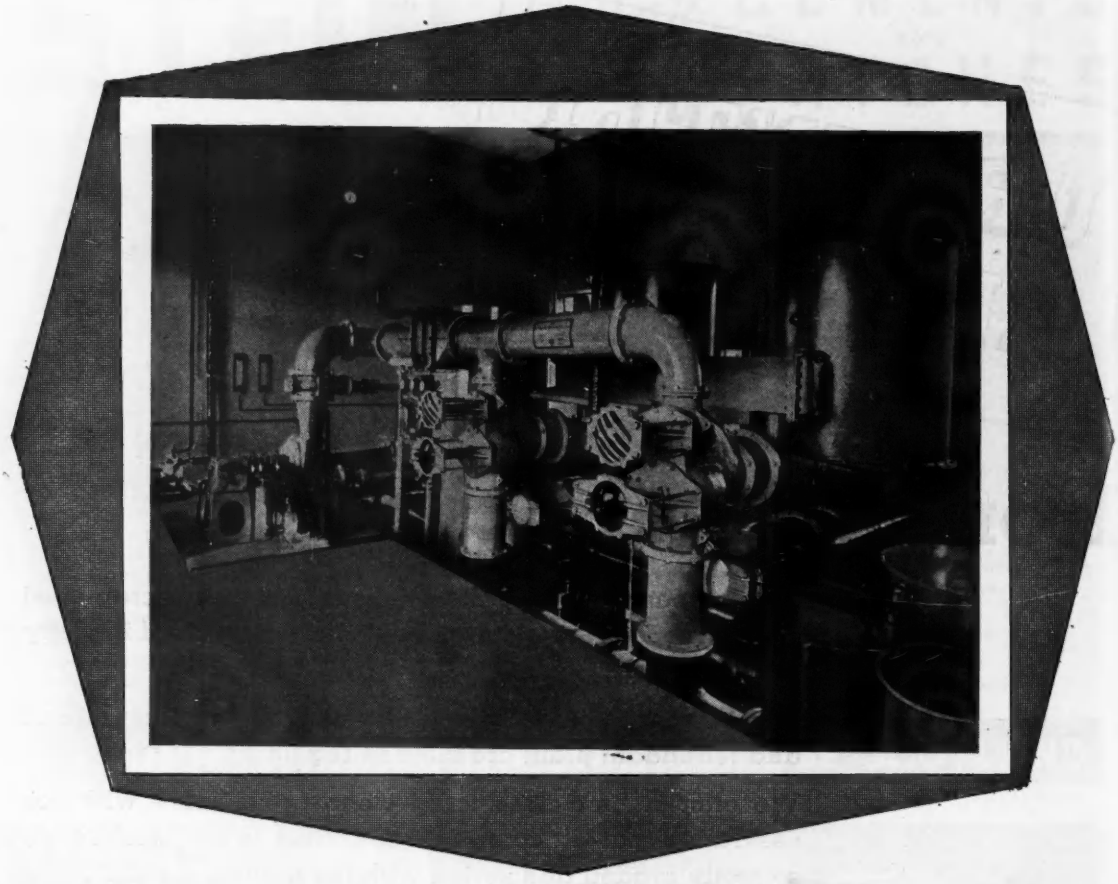

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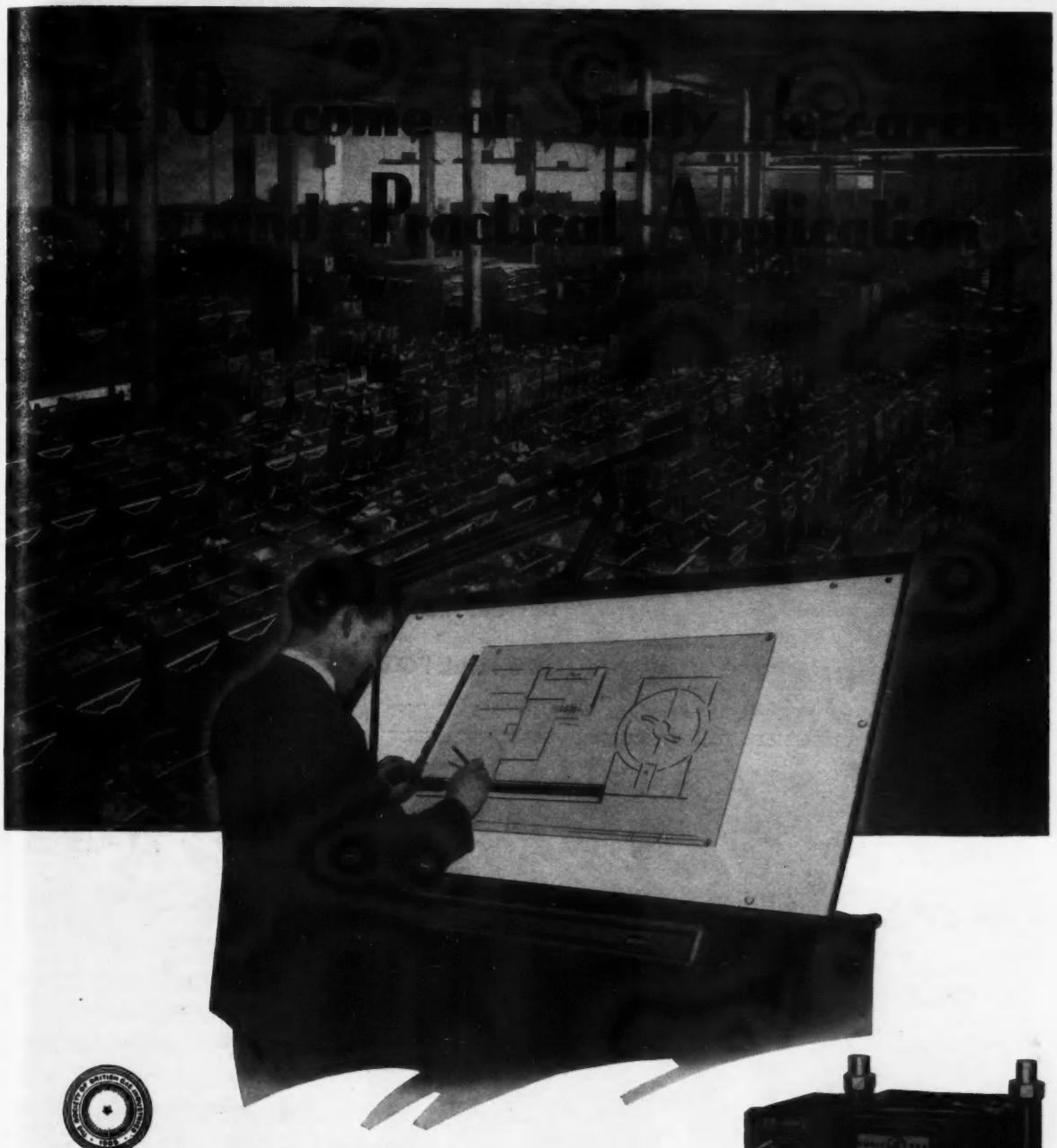

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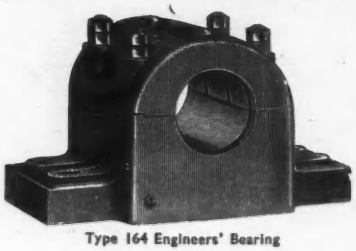

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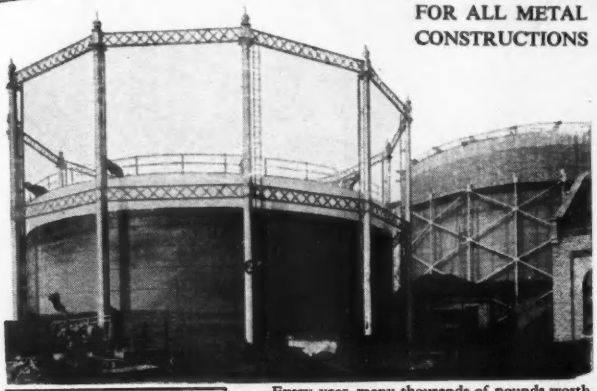

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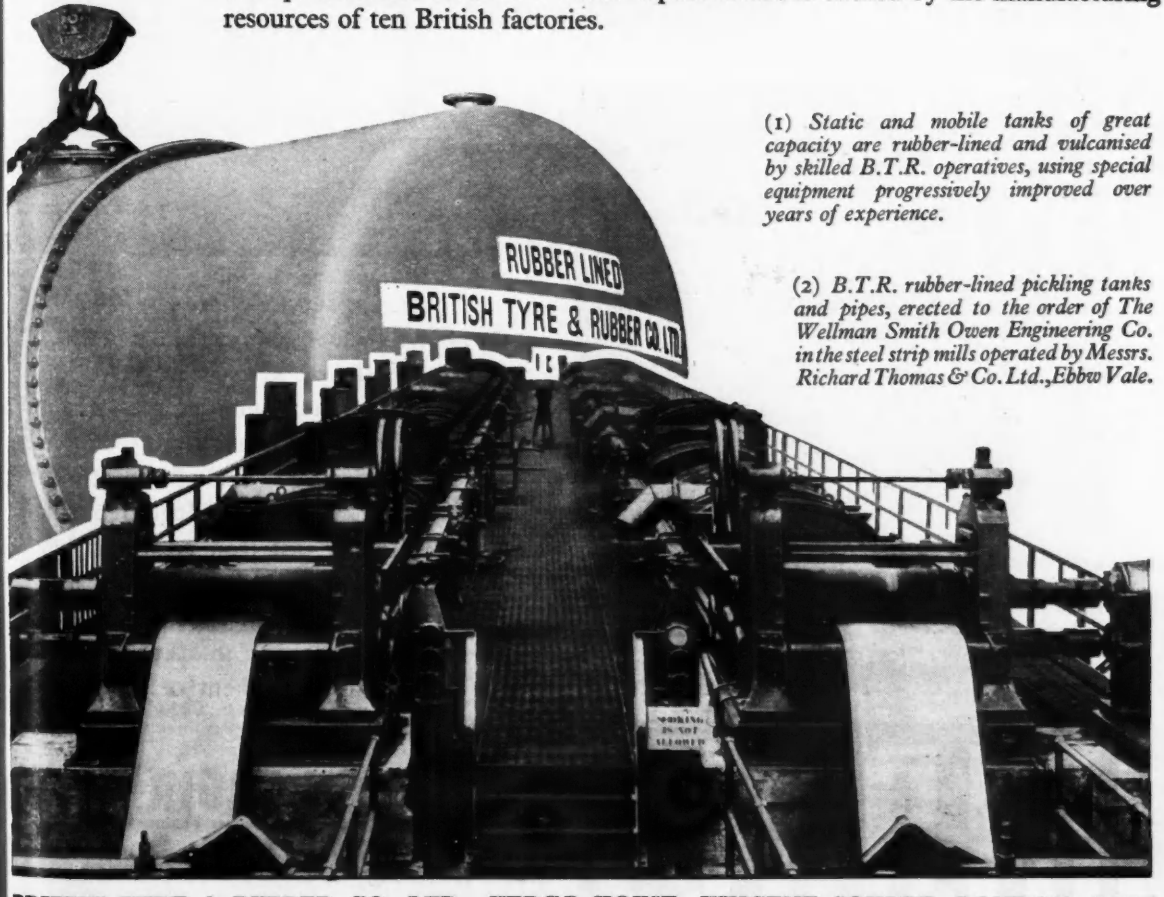

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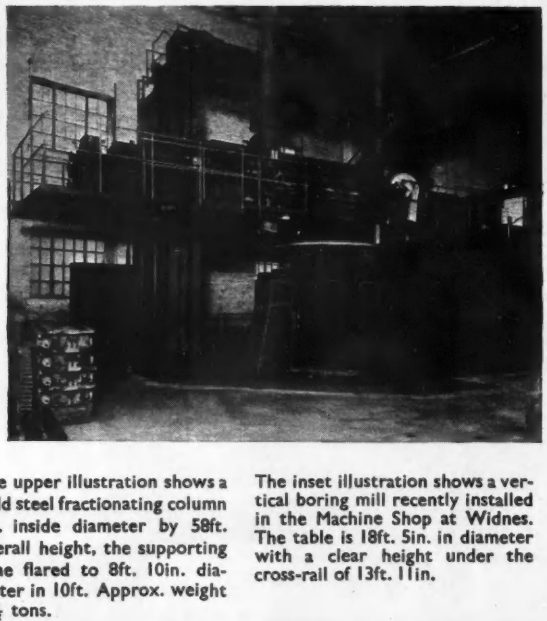

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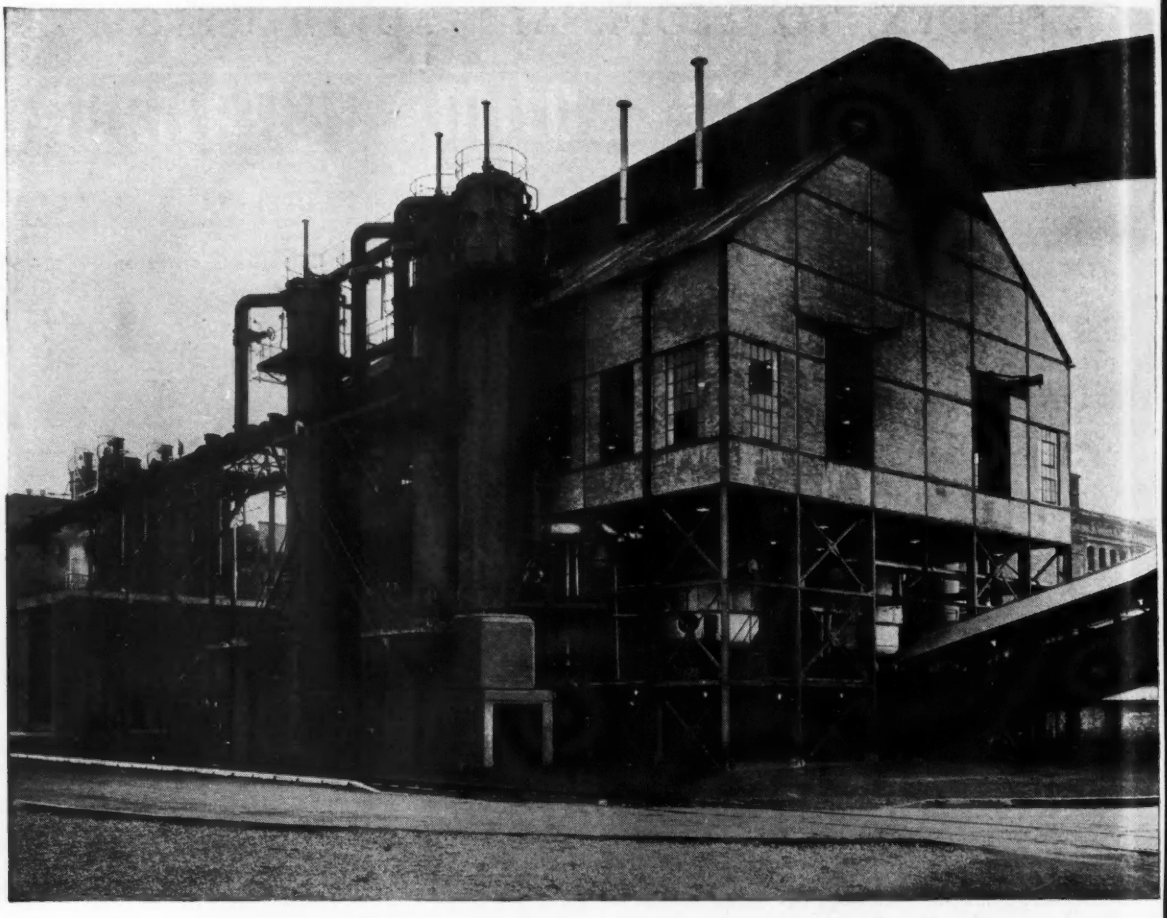

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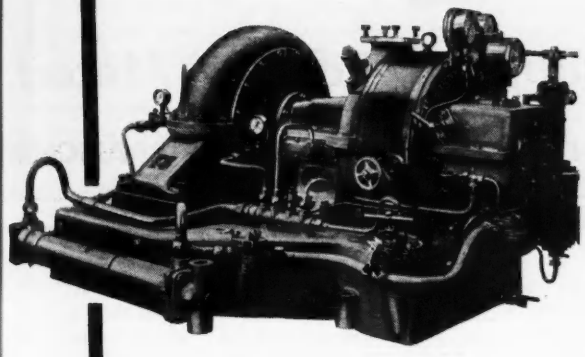

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GAS JOURNAL

VOL. 264. NO. 4567 102ND YEAR DECEMBER 13, 1950

PRE-STRESSED CONCRETE IN THE GASWORKS

REINFORCED concrete, ferro-concrete, the combination of steel and concrete, is an elegant constructional device. In the ideal, the steel is to take the tensile stresses, a duty to which it is admirably suited, the concrete is to take the compression. The steel embedded in the concrete is safe from corrosion so long as the protecting cover is intact. But concrete is weak in tension. Unfortunately, in such a structure as, for instance, a horizontal beam the bottom zone is in tension, and while the steel reinforcement there embedded takes the tensile stress it yields appreciably in so doing and the concrete, becoming subject to tension, gives way in cracks through which moisture and corrosive substances may gain access to the steel with destructive results. Similar phenomena are observed wherever any portion of a ferro-concrete structure is subject to tensile stresses. A new technique has come into vogue to remove this blemish from a very useful constructional material.

Mr. S. V. Gardner (North Thames Gas Board) set out, in his paper to the Institution of Gas Engineers, principles of the new method and presented several examples of its application in gasworks constructions. Briefly, the practice of pre-stressing is to induce in the tensile zones of a structure, by the application of external force, such a compressive stress as to cancel out, or a little more, the tension due to the superimposed load. As Mr. Gardner puts it, this stress is arranged to be approximately equal in magnitude and opposite in sign to the tensile stresses induced by the live and dead loads, so that the final stress in the concrete can always, and at all sections, be entirely compressive. Cracking is eliminated.

There is, of course, more to it than that. 'This condition cannot be achieved without a considerable increase in the stress in the reinforcement.' The tension required to induce the compressive stress in the concrete is additional to the tension due to the superimposed load and which the reinforcement must in any case withstand. The total tension is more than can be conveniently carried by the ordinary mild steel reinforcement—or, to put it another way, if mild steel reinforcement of sufficient cross-section were provided to carry the total load it would be too bulky to be enclosed in the concrete. There are, besides, other reasons why high-tensile steel must be used in the construction of pre-stressed concrete, a discovery which Mr. Gardner attributes to Freyssinet, 'who realised why earlier experiments in pre-stressing, using ordinary mild steel rods, resulted in failure.'

In our editorial comment of June 7 last (p. 631) under the title 'The New Concrete,' we called attention to the admirable paper presented by M. Eugène Freyssinet to a joint meeting last year of the Société des Ingénieurs Civils de France (British Section) and the Institution of Civil Engineers. As Mr. Gardner points out, the engineer is called upon to start studying again, this time the subject of pre-stressed concrete. The theories involved can be complex. The new method is not confined to simple beams: the engineer will be reminded of the fact that he has never really left school. The author recommends attendances at the lectures held periodically by the Cement & Concrete Association. There are extant two or three excellent little text-books on the subject. But we think the engineer might very well begin by reading Freyssinet's lively and interesting paper.

Mr. Gardner's paper must have been one of the first introductions of the 'new concrete' to gas engineers. The principles involved and the advantages to be secured are set out and the necessary warnings are given of the difficulties to be overcome. But perhaps the chief interest of the paper lies in the actual examples the author gives of its use in the practice of the great undertaking with which he is associated. Curiously enough he begins with piles, where we should have thought pre-stressing would have been of least advantage. True, the pre-stressed concrete pre-cast pile may in this way be made safe in handling. But we confess that we still do not see what great superiority is possessed by the pre-stressed pile, *once it is in position*, over its predecessor. Particularly is this the case in sub-soils where a high percentage of the bearing value is frictional resistance. One speaker pointed out that this might be as high as 40%, suggesting

that a hollow pile might be used with advantage! Piles for river work, fender piles, are in a different category, and here no doubt the greater strength and freedom from cracking has proved to be of great value. Gantries and many elements of framed buildings and similar structures are examples of the typical horizontal beam where the benefits of the new method are easily recognised.

Engineers will look hopefully to the success of this technique in the elimination of cracking in structures subjected to internal hydrostatic pressure combined with variations in temperature. The gasholder tank is a typical example. We are glad to learn that the application of pre-stressed concrete to the construction of purifier boxes is receiving full consideration at the present time. We look forward to the publication, in due time, of the result of these deliberations. We should also very much like to have as much detail as possible of another interesting job, briefly mentioned in the paper—that of the strengthening of the existing retort house foundations at Brentford. The full story would form a very satisfactory subject for exposition and discussion at an early meeting of the appropriate association of juniors. It would be interesting also to have some further information about the composition of the actual concretes and to know whether and to what extent it has been possible to make use of that other new technique, vibration, 'by which the solid particles are brought to an orderly arrangement with only such voids as can readily and quickly be filled by the hydrates provided by the cement' (Freyssinet).

The technique of pre-stressed concrete is new—yet not so new that it should not be adopted with confidence in all appropriate cases. It has 20 years successful experience behind it. It has provided solutions to problems analogous to those which are encountered in gasworks engineering. It must be remembered, however, that it calls for concrete and steel of high and special qualities, as well as for expert design and supervision. But the British constructional engineer will not hesitate to respond to Mr. Gardner's challenge, to familiarise himself with the principles involved and to carry out work in this material with that 'reliability and sound workmanship so characteristic of all he undertakes.'

ELECTRICITY SHORTAGE

THE British Electricity Authority has published its report for the year ended March 31, 1950, the second year of nationalisation, in which the industry earned a surplus of £7,163,236, compared with £4,391,684 in the previous year. Capital expenditure on electricity—£102 mill. during the year, together with £14 mill. for the North of Scotland Hydro-Electric Board—is the largest single allocation, apart from that for housing. But the Authority is of the firm opinion that, apart from generation, the amounts allocated for 1950 are insufficient to meet the industry's needs and to meet 'balanced development.' We are told that, unless the annual programmes of new generating plant can be speedily increased from the 1950 level, it will be many years before full supplies can be given at all times. The amount of power now being generated is double what it was in 1938-39, and load shedding continues. By last March there were 12,634,000 consumers—2,500,000 more than were supplied before the war. There are more electricity consumers than there are gas consumers. One-half of the electricity generated goes to industry, one-third to homes, one-eighth to commercial consumers.

At a Press conference last week Lord Citrine said that it is not only that generating capacity is inadequate, thereby necessitating reduction of load at peak periods; the whole of the grid is being overworked, and failures are bound to occur. At the same time he maintained that any attempt to reduce consumption for domestic and commercial purposes would be so serious an interference with social habits that such a decision would have to be made by someone other than the Electricity Authority—we assume by the Minister of Fuel and Power. Yet we are told that there are about 15 mill. electric fires, that the demand is growing, and—in the same breath—that abundant electricity supply is absolutely essential to our industrial development (which we do not doubt). How can we have development in the interest of national economy if there is no check whatever on the use of electric fires, a nightmare for anyone endeavouring to cope with the peak load problem? Is electricity for domestic heating too cheap? The situation is obviously out of hand. As we said in these columns a fortnight ago, as things stand at present each of the fuel industries is speaking for itself, each without the slightest regard to the others and without the slightest regard to what may be best for the polity as a whole.

FATSTOCK AND FEATHERS

IT is to be hoped that the large numbers of the farming fraternity who visited that greater barn at Earl's Court last week had no difficulty in finding their way about. No doubt the professional nose could easily lead its owner to any desired part of the livestock exhibits, but the infinitely larger mechanical section was another matter. As one of the handful of pale townsmen present, the *Gas Journal* visited the show with but one major object—to see and compare the gas and electrical stands. It appears an easy task, but lacking the keen eyesight and sixth sense of the countryman, the process of location proved a protracted business. Ignoring the mute appeal of a Lincoln Red shorthorn, and sub-consciously envying a Highland steer its overcoat, our route took us through interminable ranks of tractors to a small notice bearing the words 'Stands 161-372, Sheep and Pigs.' From this it was the task of but an hour or so (negotiating lesser livestock which expressed no greater sympathy for us than ours for them) to find the Gas Council stand.

Once found, the stand proved to be rewarding. The first point of interest was, that in outward appearance it in no way resembled that shown at the Dairy Show recently; in view of the similarity of the two shows and the fact that the audience was in part the same, this was praiseworthy. The principal feature was a working dairy unit, served by a gas-fired steam boiler and pump, and linked up with a pasteuriser, steaming stool, and trough. Other appliances shown, such as water heaters, sterilising cabinet, pasteurising pan, etc., were also of direct appeal to the farmer. All this was as it should be, but we question whether it was good policy to ignore entirely the domestic field. Farmers there were in plenty but farmers' wives too, and the fact

that there was considerable activity round the stand of a manufacturer of solid fuel cookers and water heaters suggests that Mr. Therm on the farm might have been supplemented by Mr. Therm in the kitchen. The stand was not large and to crowd the agricultural exhibits would have been a mistake, but even photographic treatment of domestic equipment might, we suggest, have attracted further attention. This must not, however, be taken as a major criticism of a stand which was, in our view, bright and distinctive. Again we commend the Gas Council's representation at this and other shows which were formerly by-passed by the industry.

The Smithfield Show receives further comment elsewhere in this issue, together with a description of the Gas Council's stand at the Poultry Show. The latter followed previous example by concentrating on 'Prestige' cookery demonstrations, but also gave prominence to home laundry equipment and filmic propaganda. Recipes demonstrated had an exotic quality which contrasted sharply but not unpleasantly with a December cold snap: Spanish stewed cockerel and Hawaiian chicken curry, for example, while 'floating islands' might be of Polynesian or Hebredean descent, according to the eater's fancy and, perhaps, their temperature when served. Of 'Devil's food cake' the less said the better. At risk of labouring the point we might mention the demonstration on 'Using odd egg yolks and whites;' we feel that readers who have received only half an egg on their ration may be interested in what to do with it.

STORM IN A GAS METER

If the volume of correspondence was anything to go by, the action of the Southern Gas Board in discontinuing in the Bournemouth area the penny-in-the-slot meter aroused what the popular Press is pleased to call 'a storm of protest.' The matter was considered at some length at a recent meeting of the Consultative Council, and after a very full explanation by the Chairman (Alderman J. W. Moore) it was generally recognised that economies such as this must be effected if the price of gas is to be kept at a reasonable level. It is obvious that any far-reaching action of this kind must inevitably bring a few cases of hardship in its train; but the Board has given an assurance that all such cases will have sympathetic consideration and, where genuine, the penny slot will be re-introduced. (The change-over was effected merely by sealing the penny slot of the dual-coin meters, which will reduce collections from six weeks to three months.) In our view the only objection can be one of inconvenience, due to shortage of shillings—and many electricity meters also require the same illusive coin. We are somewhat sceptical of the result of the Board's appeal to local banks to circulate more shillings. It is rather a matter for the Royal Mint than for the local bank. But there is very little doubt what the great majority of consumers' answer would be to the question: 'Would you rather have a shilling meter or dearer gas?' and the fact remains that a pennyworth of gas does not go very far these days. We would add that discussion at the meeting resulted in a request to the Southern Gas Board to take the Council into consultation before making such decisions in the future—even if only to place the members in a stronger position to explain the reasons to the bodies they represent.

THE COAL POSITION

Recent official pronouncements on the seriousness of our coal position and the fact that we are taking the unprecedented step of importing this vital commodity makes the November 20 issue of 'Coal Figures' of more than usual interest. We select a few figures from the N.C.B. monthly publication to indicate the trend. The total saleable output of coal for the 43 weeks ended October 28 amounted to 177.9 mill. tons, compared with 176.2 mill. tons for the same period of 1949. During the month of October the output per manshift increased fractionally over that for the previous month, during which period the average number of face workers fell by a little under a thousand. (The proportion of face workers to total workers is 41.4%.) The number of underground workers as a whole fell during the month by 2,813, and since the beginning of the year by no fewer than 15,350. The percentage of absenteeism among all mineworkers has remained fairly constant throughout the present year, though there is a slightly improving tendency. In October it was 11.59%—a drop of 0.57% as compared with September. Of face workers, however, the absenteeism is higher at 14.16%. The recruitment and wastage figures go to show the gravity of the manpower situation in the industry. In the first two quarters of the present year recruitment dropped from 15,102 to 12,632, while wastage dropped from 21,447 to 17,294. Over the same two quarters we find the average weekly earnings (excluding allowances) fell from £8 19s. 0d. to £8 11s. 9d.—though those per manshift rose by 2d. For exports the latest comparable months are August and September—the totals being respectively 852,645 tons and 793,890 tons. The biggest importer of British coal has been the Irish Republic at 146,223 tons in September, with Denmark next at 111,108 tons. It has since been announced, however, that our exports to Eire will have to be cut by 4,000 tons per week between now and early spring.

AND COKE

The foregoing facts and figures for coal lead one naturally to a consideration of the position as regards coke—and here, too, we find ourselves faced with an impending shortage this winter. So acute is the shortage, in fact, that, as reported on a later page of this issue, the Minister of Fuel and Power has had to order a suspension of coke exports, at least for the first three months of the new year. The Minister has made a strong plea for restraint in consumption which, while not amounting to a re-introduction of the former statutory restrictions, makes it clear that only industrial and essential non-industrial consumers can be sure of getting their full requirements. Though total supplies to merchants as a whole will be at about last winter's level, deliveries to individual distributors will necessarily depend upon the proportion of essential consumers they have to supply. Corresponding reductions will be made by gasworks to non-essential consumers supplied direct. Hard coke supplies to merchants will, the Minister hopes, be about the same as last winter. In coming to his decision to impose what is tantamount to an unofficial rationing scheme, the Minister is placing a considerable weight of responsibility on the distributors in sorting out the essential from the non-essential consumers. There will inevitably be many borderline cases—and it is to be hoped that their discretion will be exercised fairly. While regretting the position in which we find ourselves, we must recognise that if coke disposals were to continue at the high level of recent months it would not be possible later in the winter for gasworks to manufacture the full amount of water gas which may be needed to maintain supplies of gaseous fuel and at the same time meet the full demands of the coke market.

FLAMES—HERE AND HEREAFTER

The adjustment of aerated gas burners does not, perhaps, suggest a subject likely to have a very high entertainment value. Nevertheless, Messrs. Blandon and Rigg succeeded at the last meeting of the London and Southern Junior Gas Association in clothing it with an interest and 'liveness' which will make the occasion long remembered. As was rightly pointed out, flame is a miracle to which we have all become so accustomed in our everyday life that we do not regard it as a miracle at all. While the authors claimed nothing new or novel in their practical illustrations of the principles of design of aerated burners, those present will have learnt much of benefit—for there is a great deal of truth in the saying that the eye remembers when the ear forgets. The authors are to be congratulated on the way they set up their 'demonstration bench' and on the fact that all their experiments went off

(we use the term in its less explosive sense) practically without hitch—though there was a noticeable reluctance on the part of members to occupy the front row! The proposal that Blandon and Rigg should take their turn on tour—if made with a degree of levity—contained more than a grain of commonsense, since practical demonstrations of this kind would be welcomed far beyond the confines of the North Thames Gas Board. Needless to say, the back-room boys from Watson House turned out in force and put across much useful information in a spirit of light-hearted leg-pulling between one department and another. Mr. Minchin was, of course, laying himself wide open when he revealed his life-long interest in flames, which, if not his job, would be his hobby. He asked for, and got from a colleague, the obvious retort in the shape of a pious hope that his interest would be as fully maintained 'hereafter!'

Personal

Mr. **Thomas McCartney,** District Manager, Muirkirk (Kilmarnock Group), has been appointed District Manager, Stevenson (Greenock Group).

◇ ◇ ◇

Mr. **J. R. W. Alexander,** M.A., LL.B., was re-elected senior Vice-President of the Chartered Institute of Secretaries at its 59th annual meeting in London on December 5.

◇ ◇ ◇

Mr. **J. E. Matlock,** Gas Manager for Shepshed Urban District Council until nationalisation of the gas industry, and subsequently local Manager for the East Midlands Gas Board, has retired.

◇ ◇ ◇

Mr. **J. R. Clark,** Assistant Engineer and Manager at Barnoldswick and Earby for the past two and a half years, has been appointed Manager of the Keswick undertaking of the Northern Gas Board.

◇ ◇ ◇

Mr. **J. E. Gray,** Secretary of the London and Southern Junior Gas Association, has been transferred from the Distribution Department, Northern Division, North Thames Gas Board, to the post of Mains Superintendent at Romford.

◇ ◇ ◇

Mr. **Leonard Lacey,** Station Engineer at Harrow, is retiring after 39 years' service with the Gas Light and Coke Company and latterly the North Thames Gas Board. Son of Mr. T. S. Lacey, Station Engineer at Beckton many years ago, Mr. Lacey started as a staff pupil at Beckton and after successive promotions he became Station Engineer at Harrow in 1927. Five years later he went to Kensal Green, where he was Engineer until 1936. Then he went to Nine Elms as Deputy Station Engineer, returning to Harrow in 1943.

Obituary

JOHN WILLIAM COBB

Professor A. L. ROBERTS writes:—

To those of us who had the privilege of knowing Professor Cobb intimately for many years his death brings a sense of deep personal loss. He was a kindly counsellor and friend to all the members of his department, both staff and students alike, and always maintained a lively and considerate interest in the activities of all under his charge. I owe him a great deal for his advice and particularly his encouragement in my early days when I had just graduated from the School of Chemistry and was uncertain about my future career. In his quiet but enthusiastic way he introduced me to the value and opportunities of working in the field of fuel and refractory materials and I am sure that my gratitude for his influence at quite a critical time will be shared by the many past students of the department and members of the industry who benefited similarly from his advice.

To discuss the results of one's researches with him was always stimulating. We went in to him in the full knowledge that, slowly, surely, but always courteously, he would place his finger squarely on the weak spots. Then he would enlarge on the wider issues and show the potential importance of the research work in relation to its industrial applications. The young student came away elated and convinced that his work was worth-while despite its shortcomings and many of us will remember with affection that in such discussions both he and his listener often lost all sense of time.

In addition to his activities in the department and in industry, he gave long and most valuable service to the Council of the University and his advice and wise judgment were invariably sought when major decisions were in the making. He leaves a fine example of achievement in many fields, and those of us who saw him frequently during recent months will gratefully remember that his clarity and alertness of mind were undimmed to the end.

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Mr. **Joseph Thomas Broughton,** for 32 years Engineer, Manager, and Secretary of the Haslingden Union Gas Company, has died at the age of 72. He retired five months ago.

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Mr. **Percy Good,** C.B.E., M.I.E.E., Director of the British Standards Institution, died in London on December 2, aged 70. He was a Past President of the Institution of Electrical Engineers and Trustee of the Basic English Foundation, set up by the Government in 1947 to propagate the teaching and study of basic English as an international and educational medium.

Diary

Dec. 15.—Institute of Fuel: 'The Heat Pump,' S. B. Jackson. South Wales Institute of Engineers, Park Place, Cardiff, 6 p.m.

Dec. 15.—North Western Gas Consultative Council: Exchange Station Hotel, Liverpool, 11 a.m.

Dec. 16.—Yorkshire Junior Gas Association: Short Paper Meeting, Bradford.

Dec. 18.—North Eastern Gas Consultative Council, Bridge Street, Leeds, 2.45 p.m.

Dec. 18.—Institute of Fuel: Elements of Furnace Construction,' J. W. Bassett, Birmingham University, Edmund Street, Birmingham, 7.30 p.m.

Dec. 20.—Institute of Fuel: 'The Downjet Coke Burner,' F. B. Karthauser, F. F. Ross, and G. C. H. Sharpe. The University, Leeds, 6.30 p.m.

Dec. 20.—Eastern Gas Board (Cambridge Division) Salesmen's Circle: 'Improving the Breed,' Arthur Forshaw, M.SC. (Chief Chemist, R. and A. Main, Ltd.).

Dec. 28.—North Thames Gas Consultative Council: Westminster City Hall, Charing Cross Road, 2.30 p.m.

Jan. 9.—Midland Junior Gas Association: 'Distribution of Gas in a Mining Area,' F. C. Hawkyard (Cannock). Birmingham.

Jan. 10.—Scottish Junior Gas Association (Eastern District): Visit to Durie Foundry, Leven.

Jan. 12.—London and Southern Junior Gas Association: 'The Performance of Continuous Vertical Retorts.' C. H. Lewis, 178, Edgware Road, W.2, 6.30 p.m.

Jan. 12.—Scottish Junior Gas Association (Western District): Paper by C. Campbell (Dawsholm). Royal Technical College, Glasgow.

Jan. 13.—Western Junior Gas Association: Visit to Bideford Works and short papers by Student Members.

Jan. 15.—Eastern Gas Consultative Council: Connaught Rooms, 2 p.m.

Jan. 17.—Eastern Gas Board (Cambridge Division) Salesmen's Circle: 'The Divisional Installation Manual.' S. Halls (Distribution Superintendent, Cambridge).

Jan. 19.—Eastern Junior Gas Association: 'About the Works.' L. W. Jarrett (Nottingham). Peterborough.

Jan. 20.—Yorkshire Junior Gas Association: 'Concerning Carbonisation,' R. K. Atkinson (Assistant Works Manager, New Wortley Works, Leeds). Wakefield.

Jan. 24.—London and Southern Junior Gas Association: Visit to the works of Electroflo Meters Co., Ltd., Park Royal.

Suspension of Coke Exports

BECAUSE of dwindling stocks, Mr. Philip Noel-Baker, Minister of Fuel and Power, has decided that all exports of coke from this country must be stopped for at least the first three months of next year. During the first 10 months of this year 1,808,327 tons of coke were exported, of which 703,963 tons was produced by the gas industry. The ban comes into effect from January 1, 1951.

Announcing the decision in Manchester on December 4, Mr. W. D'Arcy Madden, Chairman of the North West Regional Board for Industry, said that existing commitments amounting to 35,000 tons would be met. The position in the north-west was causing increasing concern. Maximum stocks in the region on September 10 were 287,000 tons, while on November 26 they were only 163,000 tons. The average reduction in stocks over an 11-week period was 11,000 tons a week, but lately the rate of reduction had increased to 18,000 tons a week. Every effort would be made to meet the demands of the industrial consumers and hospitals, but there would be no supply to the midland and southern regions until the needs of the north west had been met.

A few days before the announcement of the suspension of exports the Ministry stated that disposals of gas coke, particularly to non-industrial consumers, had during recent months been considerably higher than in the same period a year ago. The Minister had come to the conclusion that, if winter disposals were to continue at this level, stocks of coke at gasworks would be run down too quickly and that in consequence it might not be possible later in the winter for the gasworks to manufacture the full amount of carburetted water gas needed to maintain gas supplies, and at the same time to meet the full demands of the coke market.

The Minister had accordingly decided that industrial requirements, together with the requirements of essential non-industrial consumers, such as bakeries, hospitals, and the like, should be met in full. Supplies to other consumers would be somewhat less than last winter. Total supplies to merchants as a whole would be at about last winter's level, but the level of deliveries to individual merchants would depend on the proportion of essential consumers they had to supply. Corresponding reductions would be made by gasworks to consumers, other than essential, whom they supplied direct. Hard coke supplies to merchants would, it was hoped, be about the same in quantity as last winter.

The announcement added that the Minister had decided not to re-introduce the statutory restrictions which were in force up to the end of 1949, but it was most desirable that all users of coke should exercise restraint. Full co-operation was essential if more drastic restrictions were to be avoided.

On December 5 the North Western Gas Board announced that as coke production this winter was unlikely to be adequate to meet the full winter demand, steps were being taken to exercise priorities in fulfilling orders. After meeting in full the needs of industrial consumers and essential services (bakeries, dairies, laundries, nurserymen, hospitals, sanatoria, institutions, schools, and waterworks) non-priority consumers will be faced with a cut of about 5% in last winter's deliveries. The Board will take into account the requirements of consumers using special appliances such as coke grates and heat storage cookers, and special consideration will be given to the needs of pensioners and hardship cases. Requests by new consumers will be examined on their merits. It will not be possible to accept orders from new consumers who normally use other types of fuel and now seek to acquire gas coke to supplement their total fuel supplies.

The Art of Baking

More than 1,000 people visited the first post-war bread and confectionery exhibition of the Swansea and District Master Bakers' Association on November 9. There were 1,200 entries from England and Wales. Judges from London, Letchworth, Cardiff, Southend, Liverpool, and Port Talbot described the quality of the entries as the highest for many years.

A feature was an attractive exhibit by the Swansea undertaking of the Wales Gas Board. The range of equipment on show included a prover, doughnut fryer, and fondant heater, an Ellerstyle 'Thermspray' boiler for steam raising, and hot water supply and space heating appliances. An attractive display panel was also included, which illustrated an all-gas Welsh biscuit factory.

We understand that the exhibition was very successful, and resulted in many enquiries being received

Exaggerations

Alderman Joseph Hoy, chairman of the Northern Gas Consultative Council, has replied to a statement by Mr. Paul Carter, prospective Conservative candidate for Hartlepools, in which he said that the increase in the price of gas would mean that the housewife had to pay 7d. to cook a Sunday dinner.

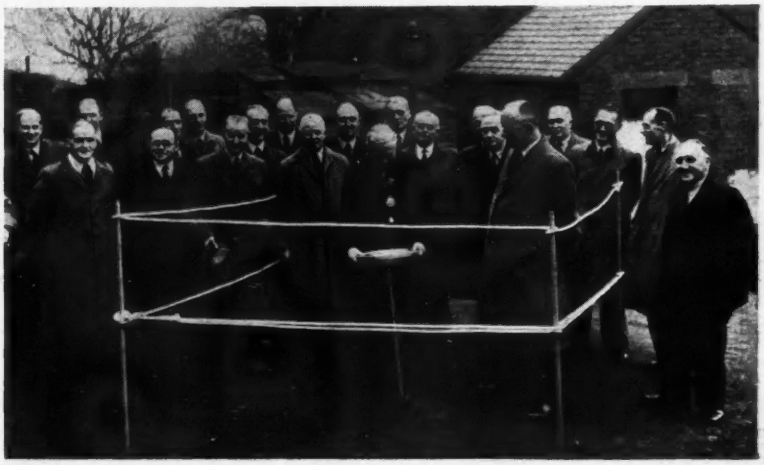
Mr. Carter also suggested that the increases were necessitated because of a big increase in the staff of the Northern Gas Board.

In his reply, Ald. Hoy said that the average cost was much less than 6d. for cooking a Sunday dinner. So far as headquarters staff was concerned he described Mr. Carter's reference as 'reckless and mischievous.' Headquarters staff, including secretarial, accountancy and engineering sections, numbered only 20 persons in all and many were recruited from the staffs of undertakings. It was the policy of the Board to make no appointment until its necessity became abundantly evident.

A LINK-UP IN THE NORTH EAST

DENBY DALE, Skelmanthorpe, and Nortonthorpe are three villages about eight miles south of Huddersfield, and the Huddersfield-Halifax Group of the North Eastern Gas Board has now completed arrangements to make all the gas at Denby Dale, installing a main for a bulk supply to the other two villages. The Chairman of the Denby Dale Urban District Council, Councillor W. H. Townsend, performed the opening ceremony at the Denby Dale works on November 7, and he later opened an exhibition of gas appliances and cookery demonstration at Skelmanthorpe which was very well attended.

The Deputy Chairman of the Board (Mr. G. E. Currier, O.B.E.), presided at both functions.



Councillor W. H. Townsend (Chairman of the Denby Dale U.D.C.) inaugurates a bulk supply of gas from Denby Dale to Skelmanthorpe and Nortonthorpe.

The Electricity Industry

LAST week the British Electricity Authority published its second report and statement of accounts for the year ended March 31, 1950. From this report we extract a few statements and figures giving a brief picture of the electricity industry today and its future aims.

Over 49,000 mill. units of electricity were generated at the power stations owned by the Authority. This was the highest production in the history of the electricity supply industry, being 6.3% above that of 1948-49, 17.5% above that of pre-vesting year 1947-48, and double that of 1938-39.

At the end of the year, supplies were being given to 12,634,000 consumers, being 452,000 more than a year earlier, 918,000 more than at vesting day, and 2½ mill. more than were supplied before the war by the former electricity undertakings.

Sales of electricity to consumers totalled 41,500 million units.* This, also, was a new high figure, being 6.2% above that of 1948-49, nearly 17% above that of pre-vesting year 1947-48, and double that of 1938-39. Half the sales were to industry, a third to domestic consumers, and an eighth to commercial consumers. Industrial consumption increased by 8%, commercial by 10%, and domestic by 1.9%.

The average selling price per unit of electricity was 1.2d.

The combined revenues of the Authority and the area boards exceeded by £7,163,236 the amount of their combined outgoings properly chargeable to revenue account.

The thermal efficiency of generation was 21.33%.

Largest Fuel Purchaser

The Authority continued to be the largest purchasers of fuel in Great Britain, consuming in their power stations in 1949-50 some 29.24 mill. tons of coal, 0.84 mill. tons of coke, and 0.05 mill. tons of oil and other fuels.

The electricity supply industry continued to use a greater proportion of low-quality coals than any other industry, the coal supplied to the power stations during the year comprising about 9% graded coals, 28% cleaned smalls, and 63% uncleaned smalls. About 16% of the coal was opencast coal, and here, also, the Authority was the biggest user.

There was a fall during the year of 1.4% in the average delivered price per ton of coal. Despite this, the price of the low-grade coal mainly used by the Authority was still so little below that of higher-grade coal, that it continued to be more economical to use such higher grades as could be obtained.

Consequent upon the extended capital development and the expanded scale of operations of the industry, the numbers employed by the Authority and the area boards increased from 156,100 to 170,500.

Unless the annual programmes of new generating plant can be speedily increased from the 1950 level, it will be many years, on present expectations of the growth in demand, before full supplies can be given at all times. Present-day uncertainties make it impossible to give any firm promise as to when plant capacity will be sufficient to meet all demand. If, however, the programmes are carried out and the growth in demand accords with present expectations—that is, taking the most favourable view—the shedding of load by switching-off consumers should be comparatively infrequent by the winter of 1954-55, and very exceptional in the three following winters, even if the weather is extremely cold. Reductions in frequency and voltage, at a diminishing rate, will still be necessary during these four winters.

In regard to increase in industrial productivity, this is dependent to a large degree on a more intensive and extensive use of electric power in industry. This is emphasised in the reports of productivity teams which have visited the United States, in which it is stressed that the high level of productivity in that country is in large part due to the wide use of electrically-driven motors, which represent much greater horsepower per operative than in Britain. The records of the two countries show that over a period of many years productivity in industry bears an important relationship to the amount of energy which is available per employee. In the United States this figure is two to three times that in Britain, and this fact accounts in large measure for the greater output per man-hour in many industries in the United States. The application of industrial power to an extent approaching the American level would go a long way towards ensuring Britain's competitive position with other exporting countries, and would provide a safeguard against any possible deterioration in future productivity arising from a numerically static population with an increasing proportion of older people.

The more extensive use of electricity, the report goes on, is also greatly to be desired for the furthering of social well-being. The value of electricity in the home—of its qualities and cleanliness, labour-saving, and convenience—is beyond question, and its variety of uses in the provision of rural amenities can do much to expand the social life of the countryside. 'By planned development and increased efficiency, British Electricity seek to provide a service which will be both comprehensive and adequate to the economic and social needs of our times.'

For 1950, capital allocation was £102 mill., which, together with £14 mill. for the North of Scotland Hydro-Electric Board, is the largest single allocation apart from that for housing. The Authority has expressed the firm opinion that the allocation is insufficient to meet the industry's needs.

After 6 a.m. the load rises rapidly, and there are two morning peaks, one between 8 and 9.30 a.m., and the other around noon. In the winter months the earlier peak is the higher largely because, owing to the shortness of the winter day, artificial light is required in homes, shops, offices, and factories well after the start of working hours, and there is an added demand for space heating purposes. In the summer such artificial lighting and space heating are at a minimum, and the peak around noon, produced by the addition to other demands of canteen, restaurant, and domestic cooking requirements, becomes the highest of the day. Apart from those two peaks, there is throughout the year a sustained high level of load in the forenoon.

After a lunchtime drop, afternoon loads are at a lower level than those of the morning, partly because commercial and domestic cooking requirements in the afternoon are small, and domestic tasks (washing, ironing, room-cleaning, etc.) are mainly done in the morning. In the late afternoon during winter, however, the added need for artificial light in offices, shops, and factories, and in the home before the industrial and office working day has ended, leads to a sharp and high peak. As the year advances and the hours of daylight lengthen, this peak becomes less in size and occurs progressively later in the day, until it becomes a separate and subsidiary peak around 10 p.m.

Rural Electrification

Extensions of supplies to farms and farm-workers' cottages has a high priority claim on the labour and materials available for electricity distribution purposes. The area boards were able during the second year to connect a larger number of farms than in the first year of operation. The number of farms now connected is 99,365.

Reference was made in the first report to the establishment by the Authority of an Agricultural Electrification Advisory Section for the purposes of maintaining close contact with research institutions and similar bodies, assisting the development of electrical means of carrying out agricultural processes, helping in the solution of economic and technical problems of supply in rural areas, and providing an advisory information service to the area boards.

The wide range of enquiries received by the Section during the year, largely from area boards, related in the main to specific applications of electricity and installations, and in particular to soil-warming, glasshouse-heating, steam-sterilising, and crop drying. At the request of some boards, talks were given to commercial staffs on agricultural organisation and the use of electricity in agriculture generally, in dairy and poultry farming, in crop drying and for horticulture. Talks were given also to agricultural audiences in different parts of the country. Information bulletins, based where necessary on performance tests under working conditions, were issued from time to time for the use of the specialist agricultural staffs of the area boards, and expert help was

(*Continued at foot of p. 547*)

* The difference between the number of units generated and the number sold to consumers represents the energy used in the power stations and absorbed in transmission and distribution.

INDUSTRIAL TARIFFS

'I AM not apologetic about the gas price position,' said Mr. C. H. Chester, chairman of the South Western Gas Board, which met at Weston-super-Mare on November 30.

Mr. Chester spoke at a lunch at the Royal Hotel, at which the Mayor of Weston (Alderman T. W. R. Procter), the Deputy Mayor (Alderman H. J. Barclay), the Town Clerk (Mr. R. G. Lickfold), the Borough Treasurer (Mr. A. G. Milton), and the chief officials of Weston Corporation were guests.

'The gas prices, in many cases,' said Mr. Chester, 'ought to have been put right prior to vesting day. We have had to put them right since, in many cases.'

Although it was not official yet, he had one 'crumb of comfort.' The Board had not yet finished investigations into a further price revision, in a more favourable direction than that to which they had been accustomed in the past year or two. There was a strong possibility of certain concessionary tariffs being introduced.

Subject to approval, they had decided to treat industry in a way which would fully recognise that there were various grades, or sections, of industry within the broad term of 'industry,' and there would be a tariff within very few months which would be so concessionary that it would probably amaze a few of the critics.

'Our prices for the whole of the South West compare very favourably with those of any area south of Birmingham, and north of Birmingham they have more favourable conditions, being situated conveniently near coal-producing areas.'

Mr. Chester said he wished to make it clear that he was not speaking either for or against nationalisation. He regarded himself as 'a gas engineer through and through,' concerned only with maintaining, and, wherever possible, improving the already high standard of efficiency in the interests of the consumer. When the members of the South Western Gas Board had been invited to serve on the Board no attention had been paid to their political convictions. Indeed, the Board was composed of men of varying shades of political thought, and he felt that this was as it should be. Members had been invited to serve on the Board on the basis of selecting the best available experience and ability within the industry.

The Mayor said he felt that much of the criticism that had been voiced about the gas boards up and down the country arose, perhaps, from a lack of understanding, due to insufficient publicity by the boards themselves. He was convinced it was not a question of 'jobs for the boys,' and he congratulated the Chairman and members of the Board on the competitive spirit and commercial initiative which they and their staffs throughout the region had retained under nationalisation. It would be a sorry day for this country if that spirit should ever be allowed to sink to a low level.

Among those who attended the luncheon were Messrs. A. W. Loveys, (Chairman of the Consultative Council); W. J. Baker (Manager, Weston-super-Mare Sub-Division); H. V. Slade; J. Carr; L. Easterbrook, O.B.E.; and Board officers districts throughout the area.

The Human Factor

The secret of high productivity lies in good personal relations, Mr. Harry Butters, whole-time member of the North Western Gas Board, told Gas Board workers at Denton on December 6. 'Mechanisation and efficient organisation of plant are of course essential,' Mr. Butters said, 'but if the personal relations between the workers themselves and between workers and management are not harmonious much, if not all, of the effort devoted to making the production machine efficient is in vain. Good personal relations beget high productivity even with indifferent plant. Bad personal relations beget low productivity even with good plant.

'This factor of personal relations is possibly the most important single thing those who run the nationalised industries have to study.'

In the nationalised gas industry they attached importance to personal contact between workers and members of the Board. Full information about what the Boards were doing and planning was another method of achieving good personal relations.

Works consultative committees on which representatives of workers and management could discuss problems of common interest were a third method of achieving good personal relations. They were going to institute these committees as soon as possible in the gas industry of the North West. Some had already been formed.

Mr. Butters was addressing gas workers from 11 gas undertakings in the North Cheshire area.

A Profit-Sharing Bonus was inaugurated some years ago by William Sugg & Co., Ltd., for their employees. This year the bonus amounts to 7% of the wages earned by each employee during the financial year, based on a normal working week, and is equivalent to approximately 3½ weeks' wages. It was paid to the employees during the week ended December 9.

ELECTRICITY INDUSTRY—
concluded from p. 546

afforded in connection with electrical exhibits arranged at agricultural shows by the boards and the British Electrical Development Association.

The general policy of area boards on the hire-purchase and credit-sale of electrical appliances was co-ordinated, and facilities for these means of purchase are available through the service centres of each board. Hire-purchase and credit-sales now almost wholly replace pre-war hire methods. Mutual arrangements have been made between individual area boards whereby the consumer, on moving from one board area to another, retains the appliance and makes the hire-purchase or credit-sale payments to the board in whose area his new address lies. Similar interchange arrangements apply to guarantees and repair and maintenance contracts.

Domestic Coal Consumers' Council

The Minister of Fuel and Power has re-appointed the Domestic Coal Consumers' Council for its second term of office. As already announced Mrs. F. H. Cantwell, J.P., a member of Islington Borough Council, is Chairman in succession to Dame Vera Laughton Mathews, who resigned to take up an appointment with the Gas Council. Mrs. C. Bamber, past National President of the Women's Co-operative Guild, has been re-appointed Deputy Chairman. The members' new period of office will extend to July 13, 1953.

Under the Act the Domestic Consumers' Council may consider any matter affecting the sale or supply of coal, coke, or manufactured fuel for domestic purposes and for purposes other than those involving supplies in bulk (which are covered by the Industrial Council). Such matters may arise either from representations by consumers or on the initiative of the Council. The conclusions of the Council in appropriate cases are notified to the Minister of Fuel and Power and the Minister may also ask the Council to report on matters referred to that body by him.

In the selection of members for the Council the Minister took into account recommendations made to him by bodies representative of the interests concerned. Representations were considered from the Association of Municipal Corporations, the Urban District Councils' Association, the Rural District Councils' Association, the Metropolitan Boroughs' Standing Joint Committee, the Convention of Royal Burghs, the Association of County Councils in Scotland, the Counties of Cities Association, the Chamber of Coal Traders, the Parliamentary Committee of the Co-operative Union, the Trades Union Congress, the National Council of Women, the Standing Joint Committee of Working Women's Organisations, the Women's Co-operative Guild, the National Federation of Women's Institutes, the W.V.S., and the Scottish Women's Rural Institutes.

The National Coal Board is represented on the Council by the Deputy Chairman, Sir Arthur Street, and the Marketing Director, Sir William McGilvray. Dr. D. T. A. Townend, Director of the British Coal Utilisation Research Association, is an independent member of the Council. The gas industry, as producers of coke, is represented on the Council by Mr. J. O. Cooke.

The Secretary of the Council is Mr. H. L. de Bourcier, M.B.E., Ministry of Fuel and Power.

MR. THERM LENDS

A Hand on the Land

ONCE a purely fatstock show, the Smithfield Show has reflected the steady trend towards mechanisation in agriculture. Its appearance at Earls Court, last year made it possible to increase the mechanical exhibits considerably, and the choice of the same venue this year produced an even greater proportion of machinery; so much so that livestock now represent quite a small proportion of available space. This relegation to a back seat would seem to have induced an inferiority complex, for neither low, bleat, nor grunt broke the steady hum of diesel and petrol engines, and the assorted accents of agricultural visitors.

Included in the list of new exhibitors at the show (which, to give it its full title is the Smithfield Show, and Agricultural Machinery Exhibition) was the Gas Council, making its third appearance at an agricultural show this year—the others, of course, being the Dairy Show and the Royal Show. And, closely allied to these, was yet another gas stand at the Poultry Show which, being held on December 7, 8, and 9, overlapped Smithfield, held December 4-8.

At Smithfield the Gas Council featured a stand as smart as it was effective, and—praise be—of quite different design to that used for the Dairy Show a month or so ago. Its main attraction was a dairy unit in which the gas-fired steam boiler (Controlled Flame Boilers, Ltd.) was linked up with a steam-heated pasteuriser, a steaming stool and a trough (all by T. Giuisti & Son), and the entire unit was connected to the gas supply and shown in working condition. The steam was supplied from the boiler through a reducing valve at a pressure of 5 lb. per sq.in. The boiler, with a maximum evaporative capacity of 194 lb. per hr. and a maximum pressure of 120 lb. per sq.in., generated steam at a pressure of 50 lb. per sq.in. To control the gas supply in accordance with the demand for steam, a constant pressure governor and an automatic pressurestat were fitted, ensuring economy in use and constant steam pressure. The water level in the boiler was also automatically maintained by a float switch control, incorporating a low water alarm switch and an automatic shut-off device.

The pasteuriser had a capacity of 50 gal. and was the low pressure steam jacketed type, fitted with a recording thermometer for the milk, and could be controlled either by hand or by an automatic steam valve. The water in the washing trough was heated by steam passing through a silent water heater attached to a flexible steam hose, and the steaming stool was connected for both water and steam, so that either might be injected into the up-turned churns for washing or sterilising.

Other exhibits on this stand included a 240-bottle sterilising cabinet (James Stott & Co., Ltd.), a direct gas-fired pasteurising pan (Wilson Engineering Co., Ltd.), a 'Millwall' No. 1 bone digester (John Fraser & Son, Ltd.), and two water heaters—an 'Emperor' No. 1 thermal storage set, and a D.L.R. 175 multipoint water heater, both by Thomas De La Rue & Co., Ltd. (Potterton Gas Division). Lastly, the stand included a display publicising the inevitable sulphate of ammonia.

It was unfortunate, though no fault of the Gas Council that the stand was somewhat difficult to find. That is a peculiarity of Earl's Court and the confusing system of numbering employed. A similar handicap was borne by the British Electrical Development Association, whose stand contained some excellent models illustrating in-bin grain drying and storage, pneumatic handling and conveying, and similar processes. Like the gas stand, its scope was entirely specialised, there being no allusion made to domestic equipment. In our view this might have been mentioned, if only in passing, as a possible source of interest to the surprising number of ladies present, many of whom evinced keen interest in the Aga cooker stand. However, it was no doubt thought by both parties that on a small stand the inclusion of another sphere of interest would confuse the issue.

Other Exhibitors

A surprising number of firms familiar to the gas industry were represented at the show. Among them were the following: Automatic Products Co., Ltd., W. & T. Avery, Ltd., Robert Boby, Ltd., British Ropes, Ltd., British Thomson-Houston Co., Ltd., Alexander Duckham & Co., Ltd., Dunlop Rubber Co., Ltd., Easiwork, Ltd., Four Oaks Spraying Machine Company, Goodyear Tyre & Rubber Co. (G.B.), Ltd., Geo. W. King Ltd., R. A. Lister & Co., Ltd., Mackay Industrial Equipment, Ltd., Morris Motors, Ltd., Penny & Porter, Ltd., Ransomes Sims & Jeffries, Ltd., Rotary Hoes, Ltd., Ruston & Hornsby, Ltd., Thomas & Bishop, Ltd., W. H. Wilcox & Co., Ltd., M. B. Wild & Co., Ltd.

So much for Smithfield. At Olympia the Poultry Show attracted feather fanciers from all over country. Fighting a strong battle with the assorted scents of Barnevelders, Australorps, and Frizzles, was the 'Chicken in the Kitchen' section which again demonstrated new ways of cooking and serving poultry.

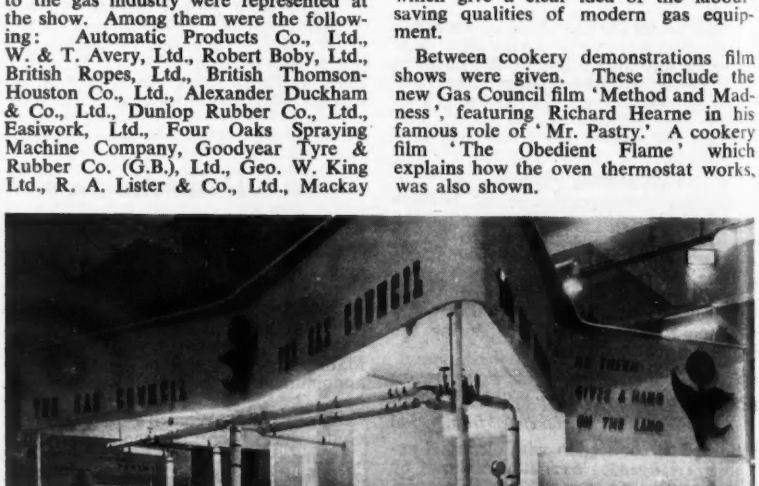
Demonstration Kitchen

In the Gas Council's demonstration kitchen, which formed part of this section, Rachel Dent, the well-known cookery expert of *Everywoman* magazine demonstrated her own recipes each day. These included Spanish, American and Hawaiian methods of cooking chicken and eggs, while carving a bird, a timely subject at this season, was one of the items on the programme.

The demonstration kitchen must have provided housewives with ideas for planning their ideal kitchen. A colour scheme of cream and blue was carried out in the unit furniture, and working top surfaces, including the sink, were in a delightful shade of blue vitreous enamel.

The kitchen could be viewed between demonstrations, and particular attention was drawn to a special display of laundry appliances and cookers, all of which give a clear idea of the labour-saving qualities of modern gas equipment.

Between cookery demonstrations film shows were given. These include the new Gas Council film 'Method and Madness', featuring Richard Hearne in his famous role of 'Mr. Pastry.' A cookery film 'The Obedient Flame' which explains how the oven thermostat works, was also shown.



A general view of the Gas Council stand at the Smithfield Show, with the working dairy unit in the foreground.

BOARD FINED FOR UNFENCED MACHINERY

A FINE of £5 was imposed by Taunton Magistrates on the South Western Gas Board for failing recently to fence the machinery of a conveyor, as a result of which an employee (Mr. F. Burge) broke two fingers and lacerated others.

Mr. J. T. Skipper (prosecuting) said that the injured employee was assisting to fill a purifier box with oxide from a heap on the ground. To take the material to the box a portable conveyor was used, which was normally driven by a small petrol engine. Another worker climbed on to the elevator to swing the engine, and Mr. Burge sought to help him by steadying his legs. As the engine was being turned Mr. Burge's right hand was caught between the chain and small sprocket wheel which drove the drum, which was not properly fenced. Fortunately, the engine did not start, and consequently the injury was not very great.

Mr. Burge said that when the other man got on the elevator to start the engine his foot slipped and knocked witness's hand against the machine. Replying to the Chairman (Ald F. W. Penny), Burge said there was no platform on which the man could stand.

Mr. Lambert (defending) pleaded guilty on behalf of the Board and expressed regret. He said that the apparatus did not form part of the equipment at the Taunton gasworks. It had come in from another works for overhaul and should not have been used at all. It was only put into operation because of the enthusiasm of the works staff to get the job done of filling the purifying box with oxide. The Board was most careful to comply with the requirements of the Factories Acts and had an extremely good record.

COMPANY NEWS

Stewarts and Lloyds of South Africa

Manufacturing and trading profit to June 30 £751,439 (£724,015), plus profits previous years nil (£6,201), profit on realisation non-trading assets £2,284 (£5.172), dividends £10,907 (same), excess profits duty refund £16,769 (nil), tax overprovided previous years £13,577 (nil), making £794,976 (£746,295). After emoluments £34,059 (£26,124), debenture redemption £7,400 (£7,100), interest £9,791 (£10,058), depreciation £98,492 (£82,554), tax £225,000 (£208,500), etc., the net profit is £420,234 (£406,459). To general reserve £100,000 (£200,000), stock reserve nil (£50,000), contingencies £150,000 (nil), preference dividend £35,500 (same), ordinary 10% £123,000 (same), forward £148,100 (£136,366).

Wailes Dove Bitumastic.

Profit to September 30, 1950, before depreciation and other charges, was £157,627 (£177,043). Net profit, before tax, £133,790 (£152,998). Taxation £65,022 (£80,204), off goodwill, patents and trade marks £14,999 (£25,000). To general reserve £20,000 (same). Final dividend 17½% (same), making 25% (same rate) on the capital of £200,000 as increased by 14 2-7ths% bonus, forward £15,645 (£13,431). The contraction in profit does not necessarily derive from a diminution of business. The financial year commenced well, but the company clearly cannot have escaped the impact of generally rising costs. Thus the trading profit is down by some £20,000. Subsequent charges for depreciation and other purposes are much the same as before, with the exception of taxation, on which there is a saving of £15,000. The result is that the net profit for the year at £68,800 is within £4,000 of the previous figure, and the earnings for the 25% dividend on the £200,000 one-class capital are 62½%. A substantial surplus is available, despite the fact that the capital ranking for the past year's maintained dividend is one-seventh larger than before as a result of the capital bonus issued in September last year.

A Record Delivery of 58 mill. cu.ft. of gas was made to consumers in the Glasgow area by the Scottish Gas Board on December 4. Previous peak was 57 mill. cu.ft. on Christmas Eve last year.

A Bill in Parliament to be promoted by the Sunderland Corporation seeks powers, among other things, to make provision for preventing smoke nuisance, the establishment of smokeless zones, and the prevention of smoke from industrial furnaces.

Regulations and Syllabuses for examinations in chemical, metallurgical, and allied subjects for the session 1950-51 are published by the Department of Technology of the City and Guilds of London Institute (31, Brechin Place, London, S.W.7); price 1s., postage 3d.

North Thames Consultative Council

The 14th monthly meeting of the North Thames Gas Consultative Council was held on November 30, at the Westminster City Hall, Councillor E. Bayliss, J.P., presiding.

In regard to the objection made at the previous meeting to the board's requirement on their application form for gas supply, that female signatories should state their exact legal status—*e.g.*, spinster, widow, 'femme sole' etc., it was reported that the Board had agreed to amend the form as soon as present stocks were exhausted.

Mr. W. S. Gooch, Controller of Services, North Thames Gas Board, gave an address describing the work of the service departments.

Notification was received that, in conformity with the Gas Act 1948, the Board had decided, with effect from January 1, 1951, to fix the maximum price at which gas may be re-sold at not more than 3d. per therm above the flat rate price for the time being in force This provision in the Act applied particularly to landlords of blocks of flats, apartment houses, hotel-keepers, etc., who re-sell gas to sub-tenants and occupants of hotel rooms.

It was explained that the Board had no power to enforce compliance with this provision and that action in any dispute lay entirely between the landlord and the tenant.

Kirk and Co. (Tubes), Ltd., have appointed Mr. K. Worth, 'Kendor,' Longford Road, Neath, Glamorgan, as selling agent for their products in South and Central Wales and Herefordshire, and Mr. D. J. Hudson, 39, York Road, Edgbaston, Birmingham, as selling agent for Shropshire, Staffordshire, Warwickshire, and Worcestershire.

The Hurseal heat display stand at the Fuel Efficiency Exhibition, Manchester—a joint effort on the part of two Hurseal agents, Sealrays, Ltd., of Manchester, and Perrin Hughes and Co., Ltd., of Liverpool. Besides radiators operated by gas, electricity, paraffin, and solid fuel, Hurseal make the Hurseal-Leda heated towel rails, as well as towel rail attachments for certain radiators.

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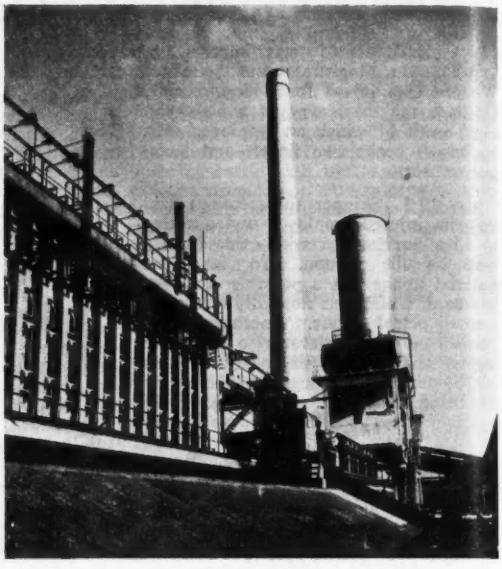
A Great Day at East Greenwich

INAUGURATION OF THE NEW COKE OVEN PLANT BY THE DUKE OF GLOUCESTER



THE South Eastern Gas Board received its first Royal visit on December 7 when His Royal Highness the Duke of Gloucester, K.G., inauguraetd the coke oven plant at the East Greenwich works. And it was indeed a Royal occasion. The large number of guests assembled to witness the ceremony —themselves constituting something of a Who's Who in the Gas Industry— had one predominating subject for thought and conversation. In truly English fashion this was the weather. Due either to Providence or perhaps some friendly pulling of strings at the nearby observatory, the afternoon elements played their part in making the ceremony impressive and enjoyable.

Welcoming the Duke to the East Greenwich works, the Chairman of the South Eastern Gas Board, Mr. W. K. Hutchison, explained that the origin of the day's ceremony lay in decisions taken over six years ago by the directors of the former South Metropolitan Gas Company to undertake extensive modernisation of their manufacturing plant. The scale of operations at East Greenwich had been sufficiently large to permit the installation of coke ovens. The work carried out during the last five years had included the construction of a new power house, a new river water pumping scheme, and a new coal and coke handling plant. All this work had been designed and laid out to serve future extensions of gas-making plant.

The two batteries of coke ovens now completed would carbonise 1,000 tons of coal per day, with a production of 12 mill. cu.ft. of coal gas. Work on a new water gas plant was well advanced and by next year four water gas sets with a rated capacity of 12 mill. cu.ft. of gas per day would be in service. This would provide the flexibility of output required to meet the fluctuating demands of consumers. All this constructional work had made a heavy call on materials and labour, and the progress which had been made owed a great deal to the support and assistance which had been given to the scheme by the Ministry of Fuel and Power. They were very pleased that the Minister and Parliamentary Secretary had found it possible to take part in the inauguration of the plant.

Now that the South Eastern Gas Board was responsible for the supply of gas in the whole of South London, the East Greenwich works became the more valuable as a site where gas could be produced economically in large quantities from seaborne coal. They regarded themselves fortunate in being able to take over and complete this important scheme of modernisation. Approval had already been given to the construction of a third battery of coke ovens, and the fourth battery might follow soon.

The putting to work of a plant of this kind was a long operation requiring patience and meticulous care. The first flames were lit as long ago as last August and the first trial charge of coal was made two months later. The tuning up process could now be considered to have reached the stage where the plant was ready for full operation to meet the demands which would be made upon it.

The Duke of Gloucester then inaugurated the plant by operating the ram discharging coke from No. 33 oven.

Thanking the Chairman for his welcome, the Duke expressed his pleasure at inaugurating this important stage in the modernisation of the East Greenwich works, which was the largest in South London and supplied a third of the total gas requirements of the Metropolis on that side of the river. Since the manufacture of gas began on the site in 1887, he remarked, the output had naturally shown a remarkable increase, and though during the war the demand in South London was reduced by evacuation and by damage to

Gas Journal Photo

The closing ceremony of the afternoon was the unveiling, by the Duke of Gloucester, of this tablet on the wall of the new power house.

Gas Journal Photo

Having inagurated the plant by discharging an oven, the Duke of Gloucester comments on this historic occasion. With him on the dais are, left to right, Mr. W. K. Hutchison, Chairman of the South Eastern Gas Board, the Rt. Hon. P. J. Noel-Baker, Minister of Fuel and Power, and Captain Michael Law.

property, the figures were now up to the level of 1938, and the demand was still rising steadily. During the past 60 years the works had been continually enlarged and modernised, while keeping to the original horizontal retorts as the system of production.

As elsewhere, the introduction of machinery had greatly reduced the arduous work required in the old days for the stoking of retorts, and he had been told that the present scheme for the production of coal gas from coke-ovens (with carburetted water gas in addition) introduced a much higher degree of mechanisation with a consequent improvement in working conditions. Although entirely new methods of production were now being used, it was of interest that the present plan confirmed the wisdom of the original directors in selecting East Greenwich for gas manufacture for South London as a whole. These works had the advantage of access to the lower reaches of the river, and the Board owned a fleet of colliers which brought coal down from the north to discharge at East Greenwich and the other smaller works along the riverside.

It was encouraging to know, from the trials already made, that there was every prospect of the new plant being satisfactory in every way and economical in its working. Concluding, the Duke said that he was very glad to have been associated with the inauguration of this important development which had been supported through all its stages by the Ministry of Fuel and Power. He wished all success to the new plant, and success and good fortune to the staff, the workmen, and all others who would be concerned in its operation.

Further good wishes were added by the Minister of Fuel and Power, the Rt. Hon. P. J. Noel-Baker, P.C., M.P., who described the occasion as a red letter day both for the Board and for the Ministry. This new plant, he said, might be regarded as a symbol of the progress the gas industry was making. Day by day the demand for power and heat was growing, and supplies could not be kept up. For this reason the new plant, which had an unusually high efficiency—75%—was an important development. They would also be glad to know that in the laboratories of the Board experiments were going on concerning the gasification of heavy oil—another coal saver. This indicated the imaginative effort the Board was making to overcome present fuel difficulties.

To mark the occasion, the Duke of Gloucester was then invited to unveil a tablet on the wall of the power house, after which he and all other guests were entertained at tea.

East Greenwich works, the largest of the South Eastern Gas Board, is situated on the Old Greenwich Marshes at Blackwall Point. The original site was acquired in 1881 and gas-making started there on July 30, 1887. The works now covers an area of 130 acres with an extensive river frontage and a large T-shaped jetty where the Board's colliers are unloaded and chartered vessels loaded with coke for export, when the Government permits, to the Scandinavian countries.

In recent years, the gas-making capacity of East Greenwich has been 34 mill. cu.ft. per day produced by the carbonisation of Durham coals in horizontal retorts, the carbonising plant consisting of 12 retort benches with a total of 1,800 retorts. The power system was based almost entirely on the use of steam and hydraulic power.

Towards the end of the 1939-45 war the management of the former South Metropolitan Gas Company reviewed the future pattern of gas manufacture with the intention of systematically replacing obsolete plant by modern systems. The scale of manufacturing operations at this works offered considerable scope for this and it was decided to install coke ovens as the most suitable form of base load plant and to adopt water gas generation to obtain the flexibility of output necessary to meet the daily and seasonal fluctuations in the public demand for gas.

It was therefore decided to erect, as a first stage of development, two batteries of coke ovens which would constitute the base-load element of gas production and four units of carburetted water gas plant, with a capacity of 12 mill. cu.ft. per day, to carry the flexible load. This major engineering project, with its high degree of mechanisation, naturally needed the support of auxiliary services far in excess of those already available, it being necessary to adopt the use of electric power and to provide substantial supplies of water for cooling purposes and for the extension of steam raising. New coal and coke handling systems were also required. These problems were solved by the provision of the following:—

(*a*) A power house covering the initial demand for 2,000 kWh with provision for future developments.
(*b*) Twelve waste heat boilers to supply steam for the power house and other plant.
(*c*) A river water pumping system supplying 600,000 gal./hr., providing cooling water for condensers and for gas cooling.
(*d*) An artesian well supplying 20,000 gal. of water an hour for steam raising.
(*e*) New coal handling plant.
(*f*) New coke handling plant.
(*g*) A producer gas plant for generating cold clean gas for heating the coke ovens.
(*h*) A wet purification plant for the cooling and cleaning of coal gas produced by the coke ovens.

An increase in the manufacturing capacity of the station to 70 mill. cu.ft. per day was a possibility borne in mind when the siting and general layout of the plant and its ancillaries were determined.

The New Plant

The heavy structures associated with these developments have been carried out in reinforced concrete and the ground strata and soil conditions were closely examined in order to determine the most suitable type of piled foundations to carry the designed loads. The ground is normal for this part of the Thames

Estuary, and down to a depth of 20 ft. consists of made ground and recent alluvial clay and peat, underlaid by about 25 ft. of dense flood plain gravel, followed by stiff blue clay. Cast in-situ piles have been adopted, founded at a depth approximately halfway through the gravel. The ground water has a high sulphate content, a potential cause of disintegration of concrete made with portland cement. To eliminate the possibility of attack, sulphate-resisting aluminous cement has been used for all concrete placed below ground level.

The first installation of coke ovens, two batteries each of 22 ovens, were erected by Simon-Carves, Ltd., and designed for a total throughput of 1,000 tons of coal per day. The layout of the plant provides for a duplication of this installation.

The ovens are built on a reinforced concrete decking, supported by columns carried on a reinforced concrete raft. The sub-structure so formed accommodates the fuel-gas distributing mains and the reversal equipment. The transverse beams of the decking are extended at either side to provide support for the buckstays on which the gas collecting mains and liquor and steam pipes are carried. The reinforced concrete retaining buttresses built at the ends of each battery are designed as beams cantilevered from and monolithic with the foundations.

The service bunker, which holds 3,000 tons of coal and will ultimately serve 88 ovens, is constructed of reinforced concrete. The dead weight of the empty structure on the foundations is approximately 6,100 tons, and it is supported on two reinforced concrete beams, 8 ft. in depth, each of which is founded on 186 piles. Coal is withdrawn from the base of the bunker through discharge gates set at a sufficient height to permit the charging cars to pass beneath. An electric inter-locking system between the discharge gates and the travelling motor of the charging car immobilises this car if any gate is not securely closed. The desired coal charge is obtained by adjustment of the measuring sleeves, mounted at the top of each of the four funnels of the charging car. Each charge is weighed before the car travels along the top of the oven battery to take up its position ready to fill, by gravity, the required oven through the four charging holes suitably spaced in the oven top. After charging the oven, the coal is mechanically levelled by a levelling bar on the ram machine. The weight of each charge of coal is approximately 14½ tons.

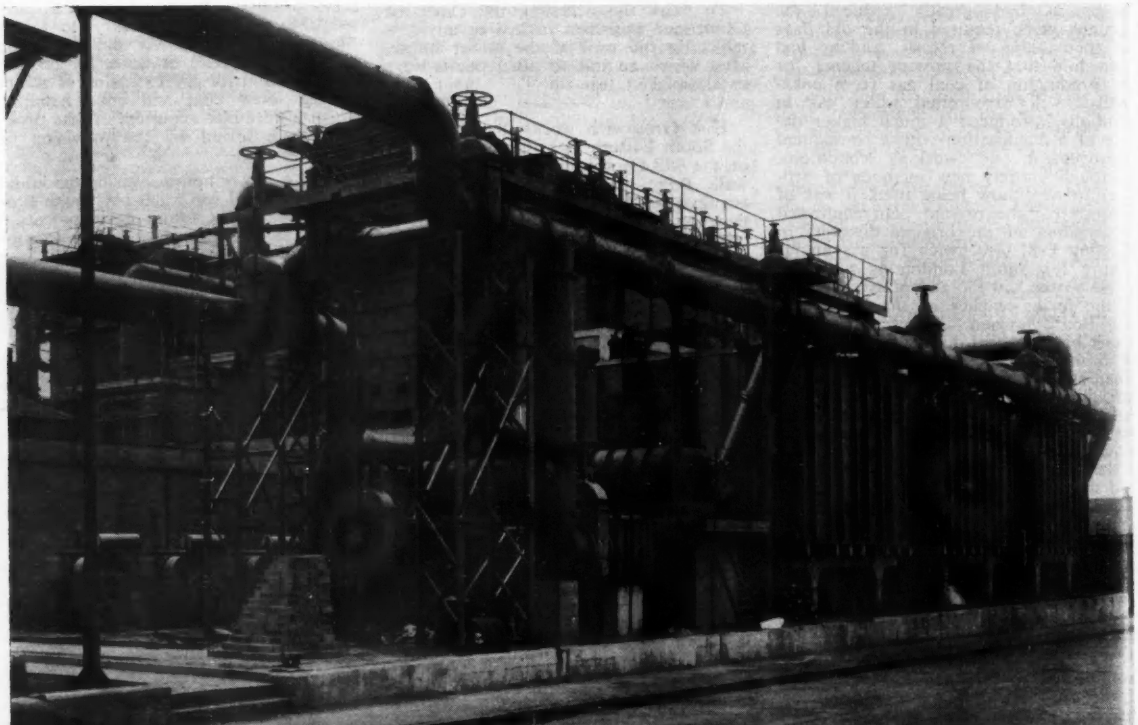
The carbonising period of 15½ hours entails the charging and discharging of one oven every 21 minutes and at the end of this time the doors at each end of the oven are removed by power extractors and the coke is pushed out by an electrically-operated ram. A coke car receives the hot coke discharged on the opposite side, and an electrically-driven locomotive propels the car, with the charge, to the quenching tower, where it is cooled by a shower of 5,000 gal. of water delivered in about one minute. The quenched coke is then spread on the sloping wharf to cool and dry before being delivered by belt conveyor to the coke handling plant.

The gas leaves the ovens through ascension pipes and collecting mains on both sides of the batteries. The ascension pipes which are 15 in. in diameter within the refractory lining are connected at their tops to the collecting mains by special pipes fitted with isolating valves to seal off the ovens during charging operations. A spray of ammonia liquor is introduced at this point and the gas undergoes its initial stage of cooling. The total flushing liquor used on the two batteries is 80,000 gal. per hour. The collecting mains then enter a common 54 in. diameter main which carries both the gas and the flushing liquor to the wet purification plant.

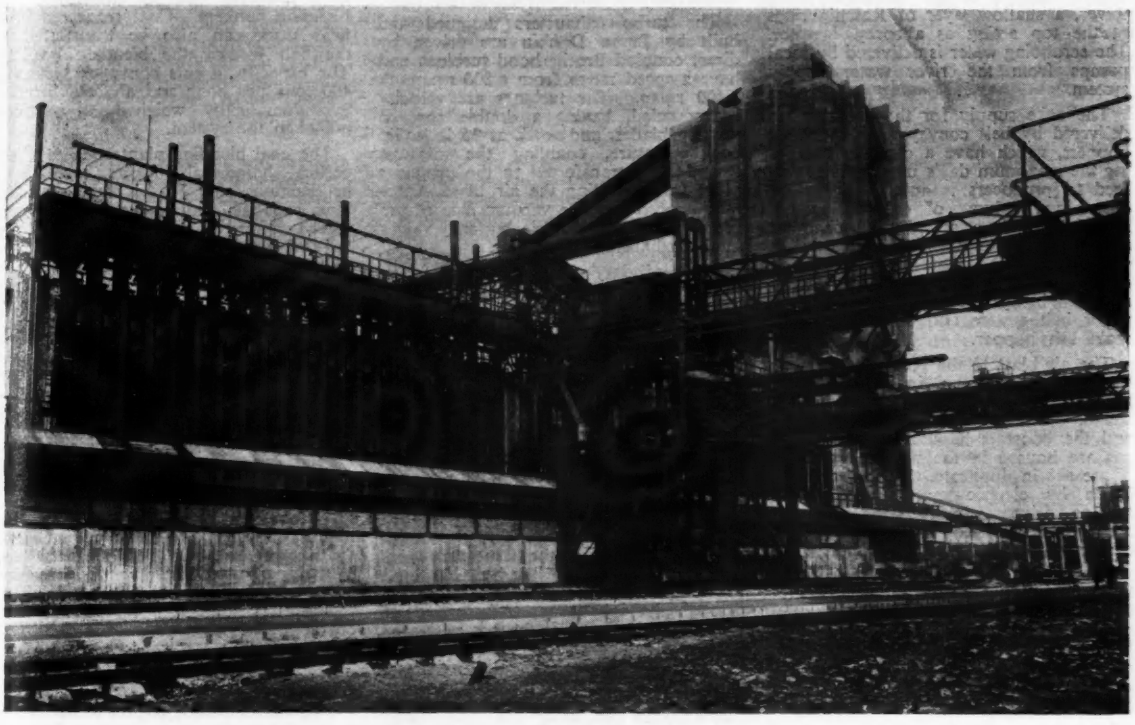
The principal dimensions of the ovens are:

Length over sole ...	44 ft. 7½ in.
Height of chamber ...	12 ft. 6 in.
Width of Oven Chamber—	
Ram side	1 ft. 3 in.
Coke side	1 ft. 5½ in.
Length of charge ...	41 ft. 7½ in.
Height of charge ...	11 ft. 4½ in.
Volume of charge ...	618 cu. ft.

The ovens are of the twin flue compound type normally heated by producer gas, but employ under-jet firing when using coal gas as fuel. By twin flue—or, as it is sometimes called, 'hair-



A general view of the Whessoe gas treatment plant for the coke oven gas stream. At the back may be seen the primary coolers. The secondary coolers are in the centre of this view. Connersville meters are located immediately following the static ammonia washers on the right.



The Ram Machine discharging coke from the oven. In the background is the service bunker.

pin' flue—is meant an arrangement whereby the heating gases pass up one flue and down the next flue in the same oven wall, a very short portway connecting the tops of each pair of flues. In a 'compound' oven, provision is made to burn rich gas (*e.g.*, coal gas) or lean gas (*e.g.*, producer gas) at will.

A high silica refractory material has been used for the oven walls, sole work, and the upper courses of the regenerators.

Due to the high rate of carbonisation the quantity of fuel gas to be burnt in a given time is relatively large and the flame volume considerable. Accordingly, flues are of ample size with an average cross-section of 490 mm. × 330 mm. The regenerators below the oven chambers are packed with filling blocks specially designed (*a*) to offer a very large surface for heat interchange, (*b*) to present the minimum obstruction to the free flow of gases, (*c*) to avoid any points on which dust could lodge with the attendant risk of choking the passages.

The regenerators ensure economy in fuel by extracting from the flue gases three-quarters of their sensible heat content, returning it to the air and lean gas, before combustion. The heat remaining in the flue gases leaving the regenerators on their way to the shaft promotes adequate chimney draught, which is finally regulated by an Askania controller.

When firing with producer gas the sequence is as follows: Producer gas and air ascend separately in neighbouring regenerators and during their passage through them they are pre-heated to 1,000° C. Oblique ports divert the gas and air to the base of the wall flue where combustion takes place and the hot gases pass upwards over the hairpin flue and descend through the next wall flue, thence by another pair of ports to the tops of the adjacent regenerators. At this stage, the temperature of the waste gas is 1,100° C, but as it flows downwards through the waste gas regenerators it gives up its heat to the fillings, leaving the base of the regenerator on its way to the chimney flue at 250° C. Reversals of flow, taking place at intervals of 30 min., are effected by mechanical devices actuated by electrically-driven reversal winches automatically timed by a master clock. After reversal all flows are in the opposite direction. In this way a regenerator chamber which has been gaining heat from the hot waste gases discharging through it in a downward direction now imparts that heat to the cold air or gas flowing upwards to the flues.

Producer Gas Plant

Normally, the ovens are heated by producer gas generated in an installation of six Marishcka type producers developed and erected by Humphreys and Glasgow, five producers carrying the load with one held in reserve. The design of this installation has been influenced by two important factors. These are, on the one hand, that the gas used at the ovens must be cleaned to a degree which necessitates cooling the gas and, on the other hand, that electric power was to be generated on site. The type of producer selected generates high pressure steam from the otherwise waste sensible heat of the producer gas. The Marishcka producer was selected because of the special design of its annular boiler, which can generate high-pressure steam in liberal quantities at the standard pressure of 160 lb./sq.in. adopted on the works waste heat steam-raising plant. Each producer consists of two annular vessels, positioned co-axially one above the other, connected by a nest of 180 3-in. diameter tubes, 2 ft. in length and arranged in three concentric rings. The diameter of the centre shell is 8 ft. and the fuel bed is contained wholly within the lower vessel. The supply of fuel is so regulated that the level of the top of the fuel is always maintained below the top of the lower section of the boiler. The hot producer gas rising from the fuel bed has to pass more or less radially through the spaces between the tubes into an exterior annular jacket, the plates of which are insulated with Fosalsil bricks. The inner surface of the jacket is also the outer shell of the boiler, giving an additional heating surface. The gas travels round within the annular jacket to the main outlet, whence it passes into the steam superheater. This superheater is rectangular and contains a four-fold nest of tubes. The total heating surface of the boiler is some 660 sq.ft. and that of the superheater 240 sq.ft. Since the upper vessel or steam annulus is only partially full of water, its inner shell plates have to be protected against overheating and a firebrick dome is constructed inside the inner shell, commencing near the bottom of the vessel.

Each producer is rated to gasify 25 tons of coke per day, graded 1-2 in., and to generate 5,400 therms of producer gas at a calorific value of 125 B.Th.U./cu.ft., or about 4½ mill. cu.ft. per day. During this same period, it provides some 70,000 lb. of steam at 160 lb./sq.in. and 500° F superheat. Each producer also has its own scrubbing unit.

which consists of an unpacked spray tower, a shallow layer of Raschig rings at the top acting as a spray arrester. The scrubbing water is delivered by local pumps from the river water supply system.

The coke supply for the producers is delivered by belt conveyors to overhead hoppers, which have a capacity exceeding the maximum day's usage. The coke feed to producers is automatic, a predetermined volume of coke being admitted through a sealed feed chamber at regulated intervals. Ash removal is also automatic, the grate revolving against a fixed plough, the ashes thereby removed being discharged on to a conveyor belt system and delivered to the main ash hopper.

The air blast to the producer grates is saturated to the required temperature by the controlled addition of exhaust steam. The air blowers to producers and the boosters handling the producer gas are housed in the machinery room. These are in duplicate, the normal drive being by electric motors with steam turbine driven sets as standby which come into operation automatically if there is a failure of electric power.

The cooled gas leaving the scrubbers is finally cleaned from dust and tar fog in plate-type electrostatic precipitators erected on the roof of the machinery house. To make the precipitated tar more fluid and to aid its flow from the electrodes, a tar oil is evaporated into the gas at the outlet of the scrubbers.

It is important for the pressure of the producer gas at the coke ovens to be controlled accurately, and this is the duty of two Foxboro Yoxall controllers, one operating on the pressure of the air supply to the producers and actuated by the pressure at the producer top, and the other operating on the pressure in the main supplying the ovens and controlled by the pressure in that main. During the flow reversal at the ovens, the demand for producer gas falls to 50% for a short time four times per hour, when two coke oven batteries are set to a reversing cycle of 30 minutes.

Wet Purification Plant

The principal units of the condensing, gas cleaning, and washing plant erected by Whessoe are arranged in the following sequence: Five primary condensers, three turbo-exhausters, five secondary condensers, four electrostatic detarrers, six static ammonia washers, two Connersville meters, two gas heaters.

The plant is divided into two streams, either of which is capable of treating the gas from 44 ovens. Two primary and two secondary condensers only are needed to each stream and the arrangement is such that the fifth condenser can be used as a standby in either stream. A fifth detarrer is unnecessary, three detarrers being capable of treating the gas from 88 ovens. Each of the three turbo exhausters can handle the gas produced in 44 ovens.

The whole installation occupies the minimum of ground space and this was achieved by erecting the condensers, detarrers, and the exhauster house on an elevated platform supported on piers all constructed in reinforced concrete. The space beneath, suitably enclosed and partitioned, houses the necessary auxiliaries, pumps, and switchgear.

The turbo exhausters designed and built by Bryan Donkin are driven by direct coupled Brotherhood turbines and have a speed range from 6,800 r.p.m. to 8,400 r.p.m. The turbines are velocity compounded, having a double row of moving blades, and work at 25 lb./sq.in. back pressure, enabling the exhaust steam to be transferred to the producer plant for saturating the air blast. Automatic control on the vacuum side of the gas stream is by Askania butterfly valves in the exhauster inlet mains.

The secondary condensers on the outlet side of the exhausters are of a greater height than the primary condensers on the inlet side of the exhausters, permitting cooling water leaving the secondaries to flow by gravity to the primary condensers. From this point the flow of water is automatically controlled to maintain a gas temperature of 40° C. at the inlet to the exhausters.

Splitting the condensing in this way makes possible the use of much smaller exhausters and lower power consumption than would be required if all the condensing was performed on the outlet of the exhauster, at the same time permitting the removal of the heat imparted to the gas by compression in passing through the exhausters. All condensers are designed to permit the gas passes to be flushed with tar to remove naphthalene deposited in the cooling process. They are of the multibular, multipass type, of welded construction throughout and designed to accord with recent data relating to heat transfer.

The static ammonia washers use softened water to prevent the blockage of the fillings which would occur as a result of the interaction between ammonia and hard water. The catch tanks for the collection of flushing liquor and condensate hold about 30,000 gal. at working level and are divided into three passes to obtain good separation of tar and liquor. A mechanical scraper removes solid deposits and the usual decantation devices have been installed. Two Connersville meters each with a capacity of 625,000 cu.ft./hr. are fixed at the outlet of the static washers, one to each stream.

The gas heaters situated after the Connersville meters warm the gas sufficiently to prevent condensation or naphthalene deposits in the overhead main leading to the oxide purifiers. Low-pressure exhaust steam is the heating agent.

Coal Handling

With the exception of the hydraulic cranes and receiving hoppers on the jetty, the plant used in the new coal handling system was erected by Sovex. Coal is removed by belt conveyors from the two sets of receiving hoppers and transferred to a single belt conveyor feeding the screening and crushing plant. This plant, which is situated inshore over a transfer hopper of 90 tons capacity, effects a size reduction to 2 in. Coal required for distribution to other works on the Metropolitan Division is diverted at the jetty to a further conveyor and is discharged overside to barges through chutes.

From the 90-ton transfer hopper, coal can either be despatched by rail to the retort houses or coal field or be fed to a conveyor belt for delivery to the blending bunkers. Coal recovered from field stock can also be transferred to the belt feeding the blending bunkers. The capacity of this conveyor system is 400 tons per hour and all coal handled is automatically weighed at various points in the system.

The coal blending plant consists of six vertical cylindrical bunkers, each 32 ft. in diameter and 74 ft. high, of 1,200 tons capacity and constructed in reinforced concrete as separate units. The base of each bunker is a ring beam carried on columns. The bottom of each bunker is in the shape of an inverted cone supported from this ring beam and is lined with Staffordshire blue quarry tiles with a cast-iron discharge mouthpiece and feed tray. The speed of the withdrawal belts can be regulated by variable gears enabling the discharge rate from each bunker to be adjusted at will from 40-150 tons per hour.

Coal flows from the vari-speed belts to a common collector belt, which delivers it to the secondary crushers, manufactured by the British Jeffrey Diamond Company. They are of the Flextooth type and each has a capacity of 150 tons of coal per hour, giving a size reduction from 2 in. to below ½ in. The present installation comprises two crushers with provision for a third.

Minimising Hard Coke

The final grade of coal is coarser than is general in coke oven practice, but this is necessary to minimise the production of dense, hard coke, which has a tendency, when made from finely crushed coals, to give, on combustion, a voluminous, floury ash.

The fluid flywheel transmission on all the electric motors on the coal and coke handling plants is of particular advantage in the case of a heavy machine like the Flextooth coal crusher as it permits the use of smaller driving motors than would otherwise be necessary, and enables squirrel cage motors to handle large starting torques.

Coal is elevated from the secondary crushers to the top of the coke oven service bunker by belt conveyors at the rate of 150 tons per hour. The capacity of these conveyors will be doubled by increasing the belt speed when the present installation of coke ovens is extended. At the top of the service bunker the coal passes to a revolving shuttle conveyor, which directs the flow of coal into any one of the three compartments of the bunker, securing good distribution and taking full advantage of the bunker capacity.

After being cooled and dried on the inclined coke wharf, the coke is transferred by belt conveyor to the new cutting and grading plant erected by Simon-Carves, Ltd.

The ungraded coke from the wharf is fed to a 3 in. grizzly screen from which the oversize is loaded by gravity into railway wagons or diverted to the cutter. Coke passing through the first grizzly screen falls on to a second, which separates material below 2 in. Provision is made to allow 50% of the coke between 2 in. and 3 in. to be diverted to the cutter; alternatively, the whole of this grade can be carried by belt conveyor to the appropriate hopper on the storage

plant. The cut coke is added to that which has passed through the 2 in. grizzly screen and the combined stream carried by belt conveyor to the grading plant, where Gyrex screens grade the material and separate it into the following sizes: 1 in.-2 in.; ⅝ in.-1 in.; ⅜ in.-⅝ in.; below ⅜ in.

These screens, erected on a reinforced concrete floor covering the storage hoppers, are substantially housed. A travelling crane and permanent lifting tackle facilitate maintenance work.

The various grades of coke are loaded from the storage hoppers through side chutes into railway trucks or by adjustable feed trays to a belt conveyor. From this conveyor the coke is delivered to existing coke sales hoppers, the producer plant, and the water gas plant. The conveyor will also feed a future boiler house. Automatic weighers function at various points. As on the coal handling plant all drives are through fluid couplings and Radicon gears and all electric motors are of squirrel cage type. As the conveyor withdrawing coke from the wharf cannot be duplicated a permanent belt-changing mechanism to expedite the changing and repairing of the belt has been installed. With the exception of this conveyor, all units of the plant are is duplicate and of sufficient capacity to deal with the coke produced by the final installation of 88 ovens.

Water Pumping and Storage

The water supply system at East Greenwich was inadequate to meet the needs of the new plant, which were:

1. An increased supply of boiler feed water for steam generation.
2. A supply of water, reasonably free from salt, for coke quenching.
3. A liberal supply of river water for cooling in gas manufacture and the generation of power.

An adequate supply of water for the first two items comes from an artesian well sunk to a depth of 300 ft. at the Board's sports ground in Horn Lane on the south-east side of the Greenwich geological fault, where the water-bearing chalk is some 100 ft. nearer the surface than on the north-west or works side. The contract for the boring of the well was given to Le Grand, Sutcliff and Gell, Ltd.

Drift material was encountered for the first 30 ft. followed by 17 ft. of rubble chalk. Below this level, the bore descends through solid chalk. The well is lined internally with 18 in. diameter tubes to a depth of 80 ft. An outer casing, 21 in. diameter, gives additional protection to the top 38 ft. in the loose upper strata and the annulus between the tubes is filled with cement grout.

A 60 h.p. Beresford submersible pump is suspended in the well, over 250 ft. below ground level, on the 6 in. diameter rising main which also carries the cable supplying power to the pump motor. The water is pumped through a 10 in. delivery main 5,630 ft. in length to an overhead storage tank at the works. A supply of 20,000 gal./hr. of water is available, of a high degree of purity and very similar to the supply afforded by the Metropolitan Water Board.

A spare pump which can be put into action within 16 hours of a breakdown is available at the well head. Adequate storage facilities on the works ensure a continuity of supply should this emergency arise. The pump is automatically controlled by a float switch in the overhead storage tank, connected electrically with a control panel in the well head pump house.

The well water is softened by a fully automatic Spiractor lime base exchange softening plant, which has a maximum hourly output of 10,000 gal. of totally soft, conditioned boiler feed water.

River Water System

River water from two reinforced concrete intake chambers built in the foreshore near the jetty and protected by a dolphin fitted with wire-mesh grids flows by gravity through a 30 in. main to two wet wells at a pumping station built on the riverside facing the lower arm of the jetty. A water velocity of 5 ft./sec. is maintained to prevent the mains silting up and Deptford rotary strainers prevent coarse solid matter reaching the plant and connections. After passing through the users it is discharged into the river through a 48 in. main into a reinforced concrete outfall chamber. This chamber is also protected by a dolphin and all three chambers are submerged at all states of the tide.

Three pumps have been installed, each with a capacity of 300,000 gal./hr. Two pumps will operate in the initial stage to give the required throughput of 400,000 gal./hr. The other is a standby. The 30 in. main from the intake chamber to the wet wells is in duplicate for future extensions. The pumps are of the slow speed vertical spindle type, driven by D.C. motors operating from A.C. supply through the medium of mercury arc rectifiers.

Carburetted Water Gas Plant

This plant serves the dual purpose of (*a*) providing diluent gas to reduce the calorific value of the straight coal gas produced in the coke ovens and horizontal retorts to the standard calorific value of 500 B.Th.U./cu.ft., and (*b*) to meet seasonal fluctuations in demand or heavy peak loads without incurring the high cost of maintaining a large proportion of standby carbonising plant.

To secure the wide range of flexibility required, the plant has been designed to produce three types of gas:

(*a*) Producer gas at 130 B.Th.U./cu.ft.
(*b*) Blue water gas at 290 B.Th.U./cu.ft.
(*c*) Carburetted water gas at, say, 400 B.Th.U./cu.ft. or above.

Carburetted water gas will be produced during periods of heavy demand, but for periods of moderate or low demand the manufacture of blue water gas will be sufficient and more economical.

The plant will consist of four sets of Humphreys and Glasgow back-run carburetted water gas generators, the site layout allowing for future extension to eight sets. Each set will comprise a generator with automatic fuel feed and ash removal, carburettor, superheater, waste heat boiler and wash box. Operation will be fully automatic by the use of Humphreys and Glasgow mechanical operators actuating Lockheed oil pressure mechanisms.

The generators will be equipped with annular jacket boilers generating steam at a pressure of 50 lb./sq.in. for use in the water gas process, or for saturating the blast when making producer gas. Steam at 160 lb./sq .in. to meet all power requirements of the plant will be produced in the waste heat boilers, of the vertical multi-tubular firetube type.

An unusual feature of this plant will be the provision of alternative means of cooling the gas produced. Condensers are essential for the cooling of carburetted water gas, but producer gas is best cooled by the direct contact, unfilled scrubber tower. Accordingly, coolers of both types will be provided, together with a suitable arrangement of valves to permit a ready change-over from one system to the other to suit the type of gas being manufactured.

A single lift relief gasholder of 200,000 cu.ft. capacity smooths out irregularities between the rates of production and demand.

The fuel required for the water gas plant, coke graded from 2 in. to 3 in., is de-breezed before being fed to the mechanical chargers.

Two oil tanks, each of 400 tons capacity, are to be erected for the storage of gas oil unloaded from tankers berthed at the jetty, or from road or rail tankers.

A Connersville meter will be installed for measuring the production of gas.

The rated capacity of each of the sets when used on the three alternative phases of manufacture is:

Producer gas	... 2.5 mill. cu.ft./day
Blue water gas	... 3.2 mill. cu.ft./day
Carburetted water gas	3.5 mill. cu.ft./day

Two hundred tons of coke per day is needed to maintain all four sets together on full load.

Power Station

A substantial amount of power is necessary to work the heavy oven machinery and its attendant crushing, cutting, screening, and conveying plants for coal and coke. Power is also required for driving the cooling water pumps, the gas boosters and air blowers on the producer and water gas plants, and for gas boosters relieving the pressure on the gas purification system, etc. This power can only be applied economically by the use of electricity and for its generation, two turbo-alternators, each of a rated output of 2,000 kW, have been provided.

These units have been installed at first floor level in a building of sufficient size to house two additional turbo-alternators to cover future extensions. The main hall of the building accommodates an overhead travelling crane having a safe working load capacity of 8 tons, which is available for maintenance purposes. The control panel of the electrical equipment is centrally placed on a balcony running along one side of the hall. Above this panel are mounted mimic diagrams and semaphore indicators to indicate top and bottom busbars, circuit breaker isolation, circuit breaker position and earthing position. To preserve a neat appearance in the hall, all

steam and water services to the turbo-alternators are disposed in the basement below.

In the rear portion of the building, the ground and first floors are used to provide lobby accommodation for many of the workmen engaged on the new plants. The transformers and low tension switchgear for plants adjacent to the power station are located on the second floor. The high tension switchgear (which is remote controlled from the central control panel in the hall) is housed in a room comprising the third floor. As a precautionary measure, provision has been made for flooding this room with CO_2 in the event of an outbreak of fire.

Wherever necessary, the interior surfaces of the building have been finished with anti-condensation plaster.

The electrical installation is large enough to justify the generation on the works of high voltage alternating current at 6,600 V which is fed into a high tension ring main. The power is generated by two 2,000 kW turbo-alternators arranged for operating in parallel. Each set is driven by a 3,000 B.H.P. multi-stage, impulse, geared, condensing type steam turbine by W. H. Allen Son & Co., Ltd. The turbine runs at a speed of 4,500 r.p.m. and is operated by steam at a stop valve pressure of 145 lb./sq. in. and a temperature of 450°. Steam is supplied partly by additional waste heat boilers installed on horizontal retort benches and partly from the annular jacket boilers of the producer gas units. The steam consumption of each turbine when on full load is slightly in excess of 30,000 lb./hr. The turbine, with its 11 Rateau stages, is mounted directly on to the surface condenser, the shell of which acts as the turbine baseplate. The speed of the turbine is controlled by a sensitive governor which operates the throttle valve through an oil relay system ensuring close governing under all conditions of load. The oil relay is supplied with oil at a pressure of 50 lb./sq. in. by a separate gear-type oil pump. Adjustment of the governor for synchronisation purposes can be made by remote control from the central control panel. In addition to the speed governor, an emergency governor is fitted, set to trip and stop the unit at 10% overspeed.

The condenser has a cooling surface of 2,250 sq. ft. and when the set is on full duty almost 200,000 gal./hr. of cooling water obtained from the river water system are required to condense the steam and provide a vacuum of 28 in. mercury at the turbine exhaust. Any non-condensable gases contained in the steam are extracted from the condenser by a two-stage steam ejector air pump. The condensate is extracted from the bottom of the condenser by a motor-driven centrifugal pump which returns it in a de-aerated condition to the boiler feed water tank.

The alternator, by Lancashire Dynamo & Crypto, Ltd., is of the revolving field type driven by the turbine through 4½-1 ratio double helical speed reducing gears at 1,000 r.p.m. A closed air circuit in which the air is cooled by water tube is used and the cooling system fitted with emergency hand operated dampers with an alarm which operates when the air temperature becomes excessive. It has a continuous maximum rate of 2,500 kVA (0.8 power factor) at 6,600 V and is mounted, together with the exciter and pilot exciter, on a common bedplate bolted to the base under the reduction gear box.

The reduction gear teeth and bearings of the turbine, gears, and alternator are lubricated and cooled by oil under pressure of 10 lb./sq. in. by a gear-type oil pump incorporated in the turbine and an auxiliary steam-turbine-driven oil pump floods the bearings when starting up. A water tube oil cooler controls the oil temperature and each machine is fitted with a Metropolitan Vickers type V.C. automatic voltage regulator with power factor compensation.

At five points on the works an electric supply is taken from the high tension ring main to local sub-stations where it is transformed down to a working pressure of 400 V a.c. Continuity of supply is ensured by the duplication of the generating equipment and by the adoption of the ring main system of distribution, which in effect provides two feeds to each sub-station where vital equipment is also duplicated. Mercury arc rectifiers convert the alternating current to direct current for the variable speed motors when required.

All switchgear and plant have been selected with a view to maximum safety and reliability under gasworks conditions.

A Laboratory Course on solid fuel analysis will be given by L. J. Edgcombe, B.SC., A.R.I.C., at the Sir John Cass College, Jewry Street, Aldgate, E.C.3, at 6 p.m., on Monday evenings, throughout the term beginning on January 8, 1951.

Sunderland Record.—During an 8-in. fall of snow in Sunderland on December 4, more than 10 mill cu.ft. of gas were supplied to consumers, easily a record. The normal daily consumption is 8½ mill. cu.ft. 'Our plant was stretched to the limit in such weather conditions,' commented Mr. W. O. Kirkwood, Divisional General Manager.

The Department of Technology of the City and Guilds of London Institute has published its report for the year 1949, including a summary of examination results in centres throughout the United Kingdom and overseas. A list of prize winners in the Technological Prize Fund is given, together with lists of successful candidates in various subjects. There is also an interesting section on the origin and activities of the Institute.

Despite the Fact that it was found necessary on one day to reduce pressure to Bradford consumers, an official of the North-Eastern Gas Board has given an assurance that as far as gas supplies are concerned Bradford can look forward to the winter with confidence. The only reduction in pressure was on December 4, when the city's output of 15 mill. cu.ft. was a record. The cause was the sudden cold spell, and although pressure was kept up throughout that day it was cut the following day. Supplies are now back to normal. The official stated that it was hoped to be able to maintain normal pressure, although there might, of course, be some reductions if demand became excessive.

Gas Stock Values

The Minister of Fuel and Power has declared by Order that the values of the following securities have been determined under the Gas Act, the conversion date being December 11, on which date the securities were extinguished and the holders became instead holders of British Gas 3% Stock calculated in accordance with the rates mentioned.

Where payments of interest made on or before November 1, 1950, by the Gas Council under direction of the Minister are not sufficient to discharge the interest due for the three successive six-monthly interest periods ended October 31, 1950, the Gas Council will, on or about February 1, 1951, make good the deficiency by paying to holders as at September 26, 1949, March 27, 1950, and September 25, 1950, any balance due for the first, second and third periods respectively. The fourth six months' interest will be paid on the British Gas Stock on May 1, 1951. The usual procedure regarding transfers, the exchange of certificates, etc., will apply. The securities are in £100 units.

Company	Compensation Value
Bewdley 6% Red. Mort. Deb. Loans	£109
British Gas Light 5¼% Hull Mort. Debs.	£107
Do. 4% Hull Mort. Debs.	£102 10 -
Do. 3½% Hull Mort. Debs.	£97 10 -
Do. 4% Norwich Mort. Debs. (Act 1896)	£100 10 -
Do. 4% Norwich Mort. Debs. (Act 1903)	£100 10 -
Do. 4% Norwich Mort. Debs. (Act 1918)	£101
Do. 3½% Norwich Mort. Debs. (Act 1875)	£98
Do. 3½% Norwich Mort. Debs. (Act 1918)	£99 10 -
Do. 3% Norwich Mort. Debs.	£90
Do. 4½% Trowbridge Mort. Debs.	£100 15 -
Do. 3½% Trowbridge Mort. Debs.	£97 10 -
Do. 5% Red. Deb. Stock	£105
Do. 3½% Red. Deb. Stock	£99
Budleigh Salterton 4½% Red. Mort. Debs.	£104 5 -
Burnham (Essex) 6½% Perp. Debs.	£152 10 -
*Do. 4% Red. Debs.	£101 5 -
Clay Cross 4½% Red. Debs.	£104
Devon Gas Association 5% Red. Mort. Debs., 1949	£102 10 -
Do. 5% Red. Mort. Debs., 1952	£104 10 -
Do. 5% Red. Mort. Debs., 1953	£105
Do. 5% Red. Mort. Debs., 1955	£106 10 -
Fowey 5% Red. Debs.	£100
Do. 4½% Red. Debs.	£100
Godalming 4% Red. Debs.	£100 5 -
Do. 4% Red. Debs., 1962	£101 10 -
Gravesend and Milton 3½% Red. Deb. Stock	£100
Halstead 5% Red. Deb. Bonds	£100 5 -
Do. 4% Red. Deb. Bonds	£100
Milborne Port 5% Red. Mort. Debs.	£101
Newhaven 4½% Red. Debs.	£101
Do. 4% Red. Debs., 1950	£100 10 -
Do. 4% Red. Debs., June, 1951	£101
Do. 4% Red. Debs., August, 1951	£101
Do. 4% Red. Debs., December, 1951	£101 5 -
Do. 4% Red. Debs., 1952	£101 10 -
Newquay (Cornwall) 5% Mort. Debs.	£125
Sherborne 4½% Red. Deb. Stock	£100 10 -
Stowmarket 4% Red. Debs.	£100 10 -
Torquay and Paignton 4½% Red. Deb. Stock	£105 10 -
Do. 3½% Red. Deb. Stock, 1964	£100
Wellingborough 4% Red. Debs., 1953	£101 15 -
Do. 4% Red. Debs., 1961	£103
Do. 3½% Red. Debs.	£101 10 -
Wincanton 4% Red. Debs.	£102 15 -
Wirksworth 4% Red. Mort. Debs.	£101
Witney 4½% Red. Mort. Debs.	£100 5 -

*This item was accidentally omitted from the list published in the *Journal* of December 6. Conversion date in this instance is November 20 and the date for payment of balance of interest January 17, 1951.

CONSULTATIVE COUNCILS IN SESSION

1d. Slot Meters Discontinued

Protests in Southern Area

GATHERED at the Grand Hotel, Bournemouth, on December 6 (under the chairmanship of Alderman J. W. Moore), the Southern Gas Consultative Council devoted considerable time to discussing complaints which had arisen in the Bournemouth area as a result of the Board's decision to discontinue penny-in-the-slot gas meters in favour of shilling meters. The outcome was a unanimous resolution requesting the Gas Board to take the Council into consultation before coming to far-reaching decisions of this nature—thus putting Council members in a stronger position when it came to explaining to the bodies they represented why such changes were made.

Prior to this, the formal business of the meeting opened with the approval of the minutes and the welcoming by the chairman of three new members—namely, Alderman Mrs. Crompton (Winchester), Councillor S. E. Vincent (Andover), and Councillor A. A. Jacques (Emsworth). Replying to a question on the subject of a financial statement on the Board's working, the Chairman pointed out that this would not be available to the Council until the Minister had first seen it. Commenting on the recent price increases (which had prompted the enquiry about the financial position), the Chairman said that the Council were unanimously of the opinion that these increases were justified. With the price of almost everything else going up they could hardly expect the price of gas to remain constant. Economies were being effected in the industry which would help to keep the price of gas at a reasonable level.

A letter was received from the Aylesbury R.D.C. pointing out that some areas enjoyed more favourable tariffs than others, and expressing the view that under nationalisation there was no longer any justification for variation in the price of gas as between one area and another. The R.D.C. asked for consideration to be given to a uniform tariff in all areas. The Chairman had replied to the effect that while uniform tariffs throughout the whole country were not practicable at this stage, the aim of the Southern Gas Board was to achieve uniformity throughout its area in the course of the coming year.

Water Heater Servicing

A number of letters had been received by the Council regarding the Board's increased charges for servicing gas water heaters. The Chairman explained that maintenance had formerly been carried out at considerably below cost, and it was decided that this service must be made self-supporting. The price had accordingly been increased to the figure which the makers charged themselves for maintenance. It was the Board's intention to make this charge twice annually, although the inspection would be quarterly. The charge (which had formerly been 4s. for all types of heater) would now be 9s. for single-point heaters and 12s. for multi-point heaters. The Chairman thought there would be general agreement that the pre-war charge could not be continued under post-war conditions. The new charge was just sufficient to cover the cost of the service.

The Council then turned to consideration of the protests which had been made against the discontinuance of the penny-in-the-slot meter. Several members were of the opinion that insufficient thought had been given to this means of effecting economy, and it was contended that 32,000 meters had been changed over without due notice. It was computed that no fewer than 384,000 shillings would be required within the first week, and enormous numbers would be 'locked up' over long periods. It was pointed out that this particular coin was already in short supply and was needed, in addition, for electricity meters. People almost always had a penny, but by no means always had a shilling on them. Cases of hardship would inevitably arise, it was stated, and consumers should have the right to choose what form of meter they preferred.

The Chairman stated that he had had consultations with local managers and had been assured that in no case had managements refused to re-introduce the penny meter where the shilling meter caused hardship. He explained that no capital costs were involved in the change-over since all that had been done was to seal up the penny slot in the dual coin meters. It was a simple matter to unseal the slot again when necessary. All the principal banks had been approached and had been asked to have more shillings available. The members of the Council, went on the Chairman, would appreciate the substantial savings that could be effected by this change-over. Meter collections would now be every three months instead of every six weeks. In consequence, six collectors who had reached retirement age need not be replaced—which would save the undertaking over £2,000 per annum. Unless such economies were effected they could not hope to keep the price of gas down—and they must support the Board in their efforts in this direction.

In answer to an enquiry as to the position in cases where a consumer who had always had a shilling only meter wished to change to a penny meter, the Chairman said the Board considered the matter in the light of the consumption, and if there appeared to be hardship the meter would be changed.

It was finally resolved to request the Gas Board in future to consult the Council prior to taking this kind of action.

Some discussion took place on the subject of the 66⅔% purchase tax on gas water heaters. The Chairman stated that at a meeting of chairmen of consultative councils in London the opinion had been expressed that there should be some reduction in this tax. The question had been put to Mr. Gaitskell who had replied that when the whole question of purchase tax was being reviewed this matter would not be lost sight of. Members expressed the view that water heaters were essential in the modern home and they should press the matter very strongly. It was eventually agreed that joint representations should be made to the Minister by both gas and electricity industries, since it was unlikely that any decision would be made in respect of one industry only.

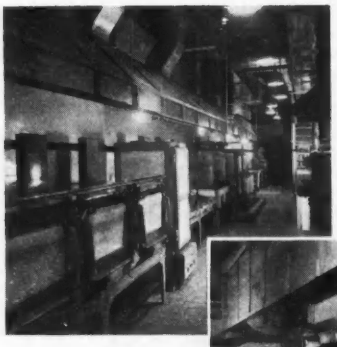
Prior to nationalisation the Portland U.D.C. had an arrangement with the local gas undertaking for street lighting at 6s. 9d. per 1,000 cu.ft. This was a fixed charge which was in operation for a number of years. In September, 1949, the price was increased to 7s. 6¼d. per thousand and in September, 1950, to 7s. 11d. The U.D.C. claimed that the price should continue in accordance with the original arrangement. Commenting on the matter, the Chairman observed that it was difficult to understand how anyone could expect to continue at the old rate when the price to everyone else had been advanced. However he could not say any more on this particular case until it had been thoroughly investigated.

Publicity for Councils

Members welcomed steps being taken to bring greater publicity to the Council and its work. Firstly, the Postmaster General had agreed to the exhibition on the notice board in all post offices in the area of the secretary's name and the address of the Council offices. Secondly, a poster was in course of preparation—it was hoped it would be distributed before Christmas—giving fuller details of the Council, its membership, and the districts served. This poster (a proof of which was passed round the table) would be displayed in all showrooms, local authority offices, chambers of trade and commerce, F.B.I. offices, and other suitable positions. This poster, said the Chairman, was on the lines agreed at the meeting of chairmen for general use throughout the country.

The meeting closed with several expressions of appreciation of the splendid way gas undertaking staffs had co-operated in the new circumstances in which they found themselves under nationalisation. The view was voiced that high as was the standard of courtesy and efficiency in the gas industry before nationalisation, it was even higher now.

The next meeting of the Council was fixed for March 28 at 2.30 p.m. at Reading.



GAS AND THE CATERING LOAD

By A. S. WILLIAMS, Assoc.M.A.C.I.
North Thames Gas Board

A Paper to the London and Southern Junior Gas Association on October 6, 1950

THE growth in catering between the two world wars was extremely rapid, and the number of persons who used the facilities offered was almost doubled. Two outstanding classes of catering that have increased their scope and deserve special mention are industrial catering and schools meals.

Industrial catering has increased from approximately 700 canteens in 1939 to a total of 18,000 canteens in 1949. Between 1924 and 1939 the number of children taking schools meals increased from 70,000 to 687,000 and by 1945 to 1,500,000, and the schools meals service is today a well founded and sound organisation.

The character of some of the classes of catering has changed in the method of the food service. The most important, the cafeteria food service system, has been adopted in many popular restaurants which previously used a waitress service, and in nearly all the industrial and office canteens. This change was mainly due to shortage of staff in the second world war. The first help-yourself service was introduced from America in 1923 when the aim was on speed rather than display and service. British catering equipment engineers now specialise in this particular type of work and this service can now embody many attractive features with accent on eye and palate appeal.

The practice of dining out has increased the business of nearly all classes of caterers, and the fact that in 1949 there were 2 mill. more people in this country than in 1938 has added to the huge everyday problem of cooking and serving meals.

This then is an industry which, although as old as any in the country, has been regarded as a Cinderella among the industries.

Over the years and certainly from the date of the first Cookery Exhibition in 1885 onwards, the gas industry has been the servant and friend of the catering industry and the goodwill that has been built up between these two industries should be preserved in their mutual interests. The gas load taken by the catering industry is considerable, but like all other classes of gas loads will vary from one area to another. In holiday resort towns, it is at a peak in the summer months with a substantial drop in consumption in the winter months. This effect on the load will be considered an advantage where other demands in the winter months are heavy.

In industrial and commercial areas where the workers are supplied with meals, the load may show a peak on five days of the week with a considerable drop on Saturdays and Sundays. This drop in load is not usually compensated for as it is related to the week-end drop in the heavy industrial demands which the week-end domestic consumption cannot balance.

In city areas, having many hotels and restaurants, the gas cooking load should be fairly even throughout the whole year and in that respect might well be considered the ideal gas load.

The smallest catering load will usually be found in the residential areas such as the outer dormitories of large towns where the most that will be required is used in tea shops and home made cake shops sited in the shopping centre of the residential area and may be as low as 1% of the total load.

The total catering gas load taken on an all-the-year-round basis is of great value despite the week-end drop in consumption which is not always compensated for by other loads. The fluctuating demand of the day varies from the peaks of 10.0 a.m. to 1.0 p.m. to a falling away in consumption of gas from 8.0 p.m. onwards to a gradual rise at 7.0 a.m. the following day. The catering gas load throughout the whole of the country is estimated at 100 mill. therms per annum, based on the total catering returns of the country. The size of this catering load makes it extremely vulnerable to attack by competitors for it is known that the commercial cooking load has long been coveted by the electrical industry and that the manufacturers of solid fuel appliances are also re-entering the field. It must be recognised that even with a well organised staff to hold this load, some losses are bound to occur, and corresponding gains will have to be made to maintain the annual consumption. It is, therefore, incumbent on the industry as a whole, including the appliance manufacturers, to anticipate any developments in commercial catering, to organise the replacement of inefficient appliances and to investigate any possible fields held by other fuels, in order that the figure can be held and improved upon.

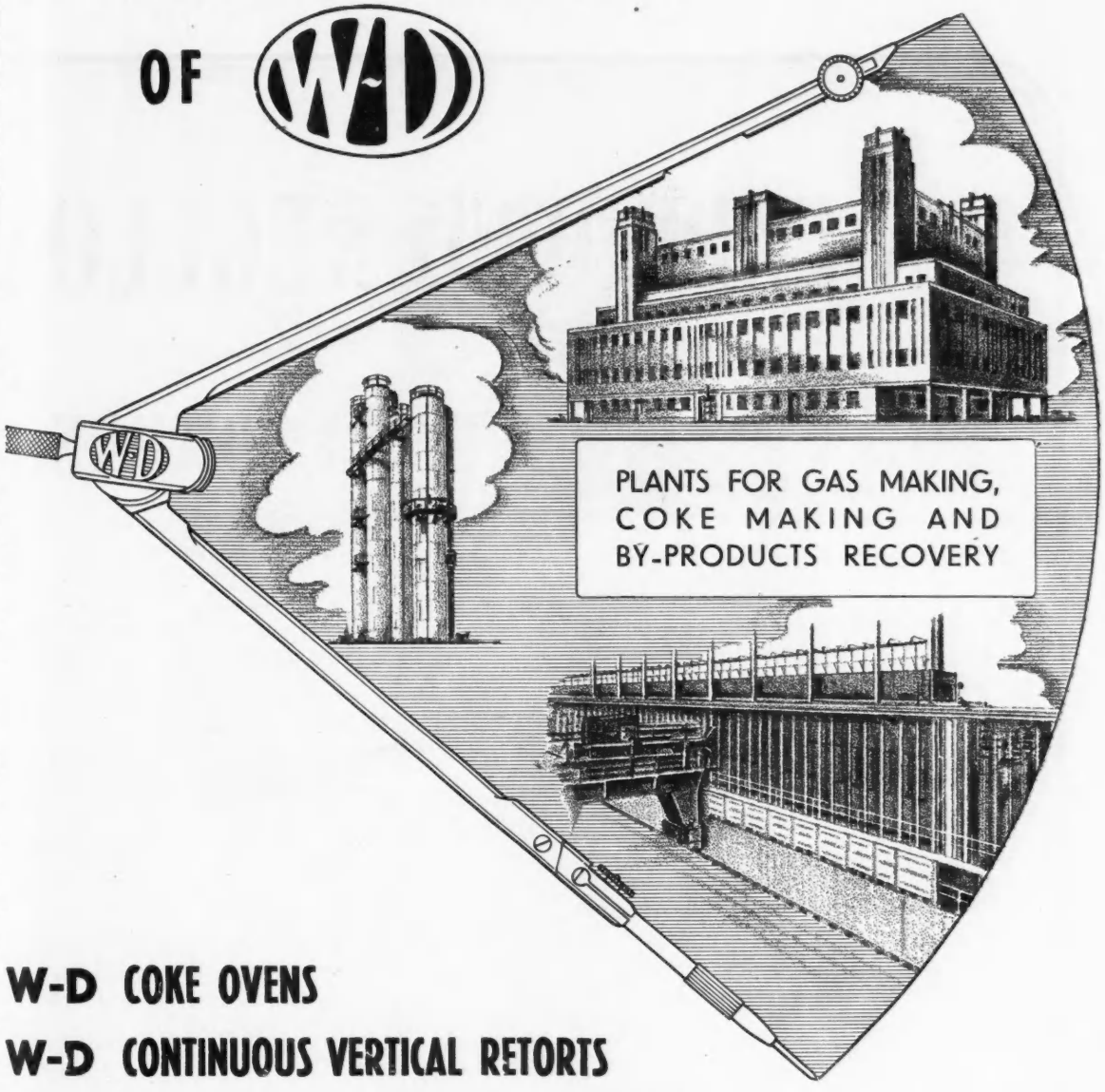
Frozen food is one aspect of commercial cooking that is taking place to-day which may increase to an extent that will revolutionise much of the catering industry and have an effect on gas cooking appliances in the commercial kitchens. This type of food has for some years been used on long distance aircraft in order that a comprehensive menu can be offered to the passenger without the food storage taking up valuable space and without waste of any kind occuring. In London's Zoo frozen food is used to a very great extent for the reason that weather can reduce a potential daily number of meals from 4,000 to 200 and it is considered that the relatively high cost of the frozen food is more than offset by the waste that would occur if perishable foods had been prepared.

Frozen foods can be divided into two classes:

1. Food that is blanched, packed and frozen and requires cooking before serving.
2. Food that is cooked, packed and deep frozen and needs re-heating to serving temperature.

With frozen foods processed by the first method no alteration in cooking appliances is required as the only difference between cooking frozen food and that of fresh foods is in the preparation and only concerns the chef. It is to be expected that a slightly lower gas consumption will be re-

WITHIN THE COMPASS OF W-D



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A new type of frontal Regulo head will be fitted to current designs of Radiation NEW WORLD cookers, the 1430 series and 3180 series. The most noticeable differences are the reduced number of markings which now cover the range ¼—9 instead of the previous ¼—12, and the absence of the visor with its triangular feature.

In the new Regulo the internal mechanism has been modified to enable the reduced number of markings to be spread over the full turn of the knob, thus allowing the figures to be made bigger and clearer. The absence of the visor makes cleaning of the dial much easier and facilitates servicing. In use the desired figure is registered positively with an inverted 'V' feature at the top of the masking plate. This Regulo is, as usual, cleanable without upsetting the calibration, and several detail improvements to the internal design have been introduced.

The graded oven heats corresponding to the various Regulo settings are the same as hitherto and instructions in the Radiation Cookery Book and on Regulo Charts are unaffected by the modified scale of marking.

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5310 A

5 Mill. Cu. Ft. GASHOLDER SPIRAL GUIDED AT GLASGOW

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In the supply of Gas to this great industry, Dempsters of Elland play their part.

This photograph shows the crown framing of the new Gasholder during course of erection for the Scottish Gas Board at Glasgow. The Gasholder, which has a steel Tank, is of the Spirally Guided type, with a capacity of 5 million cu. ft. and has now been completed.

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quired as vegetables processed by blanching usually do not take so long to cook. With frozen foods processed by the second method, no actual cooking appliances are needed in the kitchens as reconstitution is carried out in hot air cupboards at a temperature of 180°F., and such appliances are already marketed by manufacturers in the orthodox hot cupboard with the gas burners controlled by a thermostat.

It is not anticipated that frozen foods will entirely replace fresh foods as the art of the chef will always go on, and equipment will continue to be needed for ordinary cooking methods; the installation of specially designed hot cupboards may be a feature of the future kitchen, and in order to show economy and flexibility they should be built up in small units.

This revolution, if it does come about, may have the effect of reducing the catering gas load as we know it, but it can in good measure be made up by the use of gas-heated equipment used at the process factories in the cooking of the foods.

Another load of the future partially obtained now but still open to keen competition is that of dish washing. As such installations become a hygienic necessity rather than a labour saving service, more business will be obtainable.

Coveted by Electrical Industry

The electrical industry covet the catering load because of its adaptability to their existing loads and daily requirements. The summer seasonal catering load in holiday resort towns has for many years been the aim of electric supply authorities, and there is already a revival of this competition from the local boards. The peak periods of electricity supply occurs in some areas between 4.0 p.m. and 6.0 p.m. in winter months. The catering load peak of 10.0 a.m. to 1.0 p.m. with a steady afternoon demand would be acceptable to the electric supply engineer. The all-year-round character of the load will always make it attractive, and the keenest of competition is almost certain to take place.

Proof of the interest that the commercial cooking load provides is to be found in the records that show that in 1937-1938 the Central London Electricity Authority campaigned some of the caterers in their area of supply offering attractive new tariffs against the existing tariffs provided that a specified kilowatt loading of cooking equipment was installed. It was considered, at that time, that the possession of the cooking load must have been most vital for the Electricity Authority to have campaigned in such a manner. It is of interest here to record that almost all the losses suffered by the gas undertaking supplying the area have been regained either as a whole or in part.

It must not be assumed that the present day maximum demand for electrical power being in excess of the output will deter that industry from pushing ahead the commercial cooking programme. Advertisements of their equipment appear every week in the catering trade publications. Articles spurring the industry on in this field are published from time to time and the summary of all this is the same—'We can handle the catering load and we want it.' The fact that this competition will increase very rapidly must be faced, and steps taken to consolidate and improve the position of the gas industry.

The large amount of gas cooking appliances already installed is vulnerable to competition on the basis of proportion alone, and this applies particularly to the equipment installed by the caterer without reference to the gas board. Therefore, it is essential for the gas industry to have complete records of all appliances used. Such records must be reviewed at periods of 12 to 24 months and the full history of each appliance considered in the light of advising the consumer of its condition, efficiency, and potential performance in the kitchen.

An examination of all catering establishments should be made in a general manner and should be carried out by a trained staff able to converse in catering matters. The representative should have knowledge of cooking processes, the terms used in commercial kitchens, the layout of all types of kitchen and service rooms, and the principles guiding the layouts. They should also be able to advise the caterer on all matters relating to gas-heated large-scale catering appliances.

One result of the examinations and contact calls will mean that the equipment in use is under constant review and any possible inroads by competitors in the catering gas load, due to apparatus being at fault, can be suitably dealt with.

Catering Terms

The following are the main cooking processes and their application:

Baking.—To cook food by dry heat in an enclosed oven.

Roasting.—To cook meat slowly in front of heat—more commonly applies to baking of meats and potatoes.

Boiling.—To cook food in liquid at boiling point to render it tender, agreeable to the taste and in some cases to break it down—as for stocks and soups.

Grilling and Salamandering.—Food is cooked by exposing it to fierce direct heat.

Broiling.—To cook food rapidly by application of radiant heat. (This is a term used in some parts of North America, meaning the grilling of food.)

Braizing.—Combination of roasting and boiling. The difference being that the cooking is done by the juices of the meat and the steam made by a closed vessel. (As the process goes on the juices become concentrated and at this point, stock or wine is added to keep the moisture to the correct amount.)

Stewing.—To cook food in a small amount of liquid just below boiling point. Heat may be applied directly below the vessel or surrounding it as in an oven.

Simmering.—To cook food in a liquid at a temperature of 185°F.

Steaming.—Food is cooked in direct contact with steam or indirect contact.

Saute.—Combination of frying and steaming. Frying process is slow, steam is accumulated. Method used as a preliminary to other ways of cooking to develop flavour. Or to fry in small quantity of hot fat.

Deep Fat Frying.—To cook food in sufficient fat so that it is completely covered. Temperature ranged from 310°F. to 390°F.

Fricasse.—Food browned in fat and then stewed slowly. (Similar process to braizing.)

Rendering.—To extract the fat from the fatty parts of meats. Can be carried out in a vessel on top of the range or in a low-temperature oven.

Parboil.—To cook partly by boiling—for finishing by another method.

The relationship between the cooking methods and the application of the gas-fired cooking equipment is described as follows:

COOKING EQUIPMENT USED FOR THE VARIOUS TYPES OF COOKING

Equipment	Cooking process
Range ovens Pastry ovens Roasting ovens	Baking Braizing Roasting Rendering
Boiling table Stockpot stove Boiling rings Solid plate top of range	Stewing Boiling Blanching All classes of frying Poaching Rendering Simmering Sauce making Stock making Parboiling
Boiling pan	Bulk cooking of vegetables Bulk making of soups Stock making Rendering
Steaming oven	Steam cooking of pastry puddings Steam cooking of vegetables
Frying range	Deep fat frying of foods requiring a cover of fat
Salamander	Grilling or salamandering meats by radiant heat from above Browning of food already cooked by other processes Toasting
Toaster	Toasting of bread

In the consumer contact by the gas representative, the terms and names used in the catering trade will be of use:

Bain Marie.—A container heated by water, steam or air in which a container of food can be placed to keep hot.

Salamander.—A compartment embodying radiant heat from above to cook food on the grid below.

Grill.—A compartment embodying radiant heat below to cook food on the grid above.

Hotplate.—The name usually given by the trade to a hot cupboard or hot closet.

Multi-Pot.—An insulated tea or beverage container probably originated from multi-teapot.

Chef de Cuisine.—Head chef.

Sous Chef.—Assistant.

Chef Gardemanger.—Larder chef. Preparation of meat, and cold meat dishes.

Chef Saucier.—Sauces and entree dishes.

Chef Rotissier.—Roasting of joints, game, grilling.

Chef Entrementier.—Preparation of vegetables; also egg dishes.

Chef Potagier.—Soup chef.

Chef Patissier.—All pastry, compots, jellies, blancmanges.

Servicing of Equipment

The servicing of installed gas cooking equipment must receive first-class attention. A number of successes gained by gas in replacing solid fuel and electric power have been brought about by competitive apparatus being poorly serviced. The reverse can happen if gas appliances are not kept under constant supervision and serviced at regular intervals.

Inefficient equipment is often related to poor or insufficient maintenance of the appliance, and for that reason the remedy lies in regular visits by the maintenance fitter with routine checking of possible causes of defects. The frequency of the visits will be dependent upon the use of the appliances which in turn is governed by the class of trade and number of meals cooked. A kitchen fitted with a range and ancillary equipment will not necessarily require all the appliances serviced at the same time. However, it is advisable to check all appliances at each visit and to service them whenever it is found necessary and advisable.

Because of the heavy wear and tear in a kitchen, especially with cooking ranges and boiling water apparatus, it is recommended that they be serviced at intervals of two to four months, again dependent upon the output of these appliances.

Caterers who have their own engineering staff may prefer to carry out their own maintenance service and this should be encouraged as the staff are always available, but guidance in the method of servicing the appliances should be undertaken by the Gas Board. Detailed maintenance instructions compiled by the makers or the Board should be made available.

For caterers who are dependent upon the local Gas Board or engineering contractors who visit periodically, a form of interim assistance can be given by offering suggestions for day-to-day inspections by the cooking staff.

Broadly speaking, the daily inspection of appliances should refer to:

1. The correct appearance of gas flames, according to the type of appliance. Recording of fractured non-aerated jets.
2. Fracture of hotplate bars and plates and the faulty fitting of oven and steamer doors.
3. Deterioration in the flow of boiling water from machines and the detection of leaky valves.
4. Faults in cooking when using ovens controlled by thermostats.
5. Inspection of water levels in feed tanks.
6. Observation of flue equipment when fitted to a cooking appliance with an appreciation of the correct assembly of it.
7. The importance of cleaning the cooking appliances to give continual good cooking results and to aid the work of the maintenance fitter.

These are the faults that may occur in between the maintenance fitter's routine visit, and if they assume large proportions, will give unsatisfactory service and reflect seriously upon the performance of appliances concerned. The reporting of the fault either at the time between the fitter's visit or at the routine call will do much to keep the appliances in good order.

Fully Trained Personnel

It is necessary to have a first-class maintenance service, the staff of which are fully trained in the maintenance of catering equipment of all types. Such personnel should have an appreciation of the heavy wear and tear of the appliances and to be able to advise on any problems connected with elementary servicing of appliances such as the cleaning and realignment of boiling ring burners, care of float and oven taps. Always their aim should be to service the appliance in whatever condition it is so that the work of the kitchen shall not be seriously interrupted. Close liaison between the servicing staff and the representative responsible for commercial cooking is advisable if the consumer is to obtain full benefit from the gas appliances.

The re-organisation of the catering industry has brought education to the fore, and the training syllabus for students at technical and commercial colleges includes a section on the appreciation of fuels and equipment used in catering. Here then lies an opportunity to place before the student the principles of the care and maintenance of cooking equipment, and help in this direction should be offered to the education authorities.

This could be done in several ways:

1. Notes on servicing and maintenance of gas cooking appliances—The principles of appliance operations—Faults to look for in the daily cooking operations—Information on oven temperatures in relation to thermostat indicators. Such notes would be in book form, illustrated and designed for permanent use.
2. The providing of lecturers to the technical colleges to instruct on the care and maintenance of gas cooking equipment.

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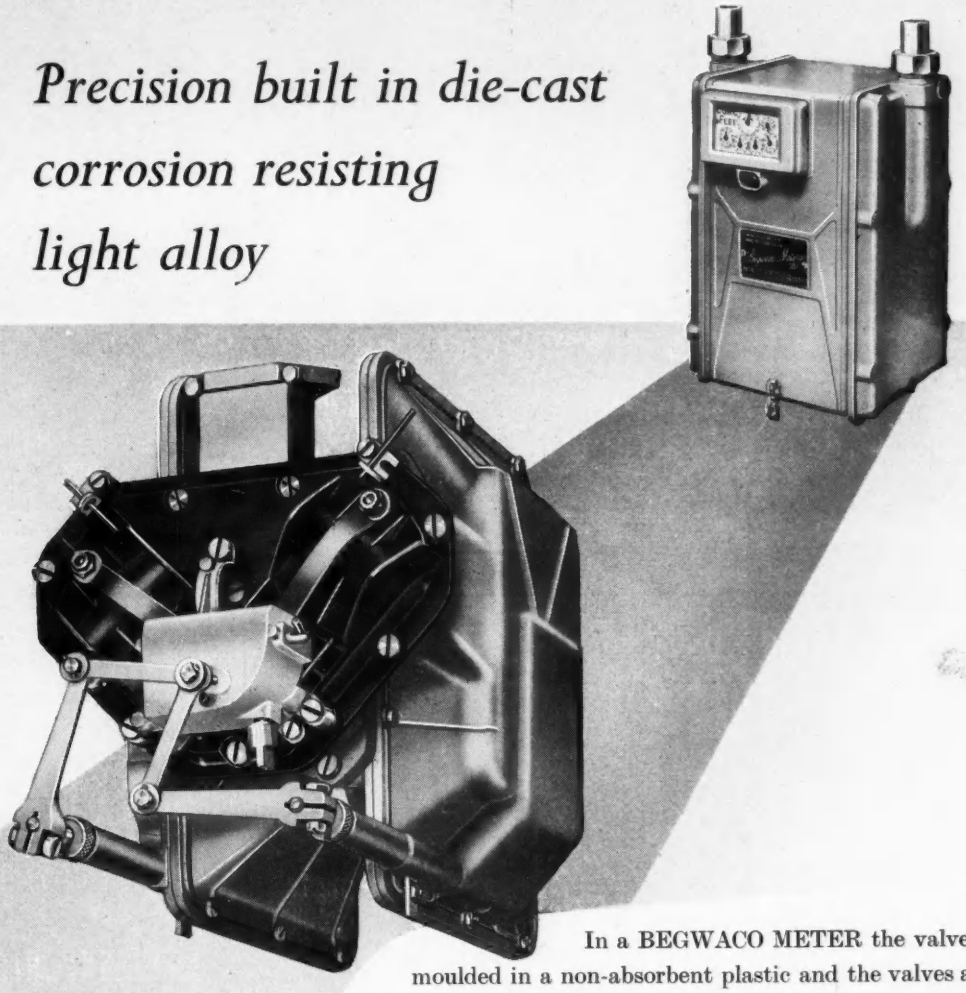

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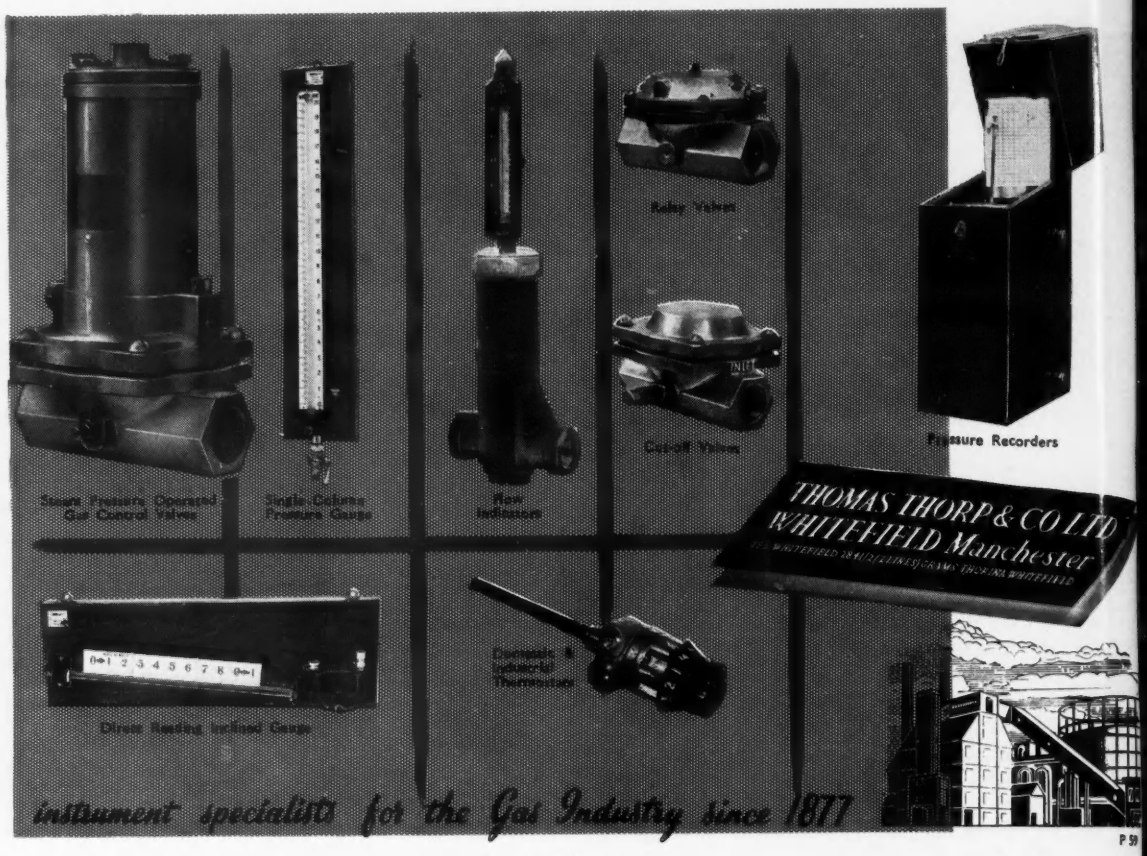

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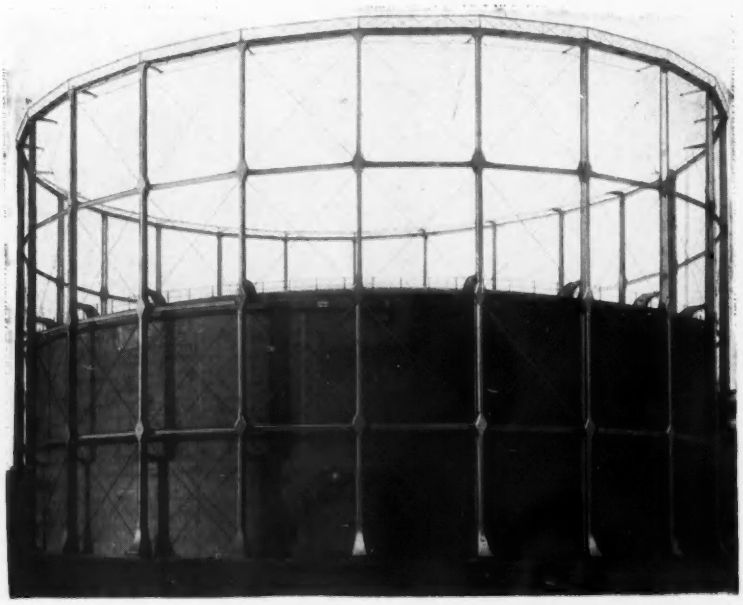

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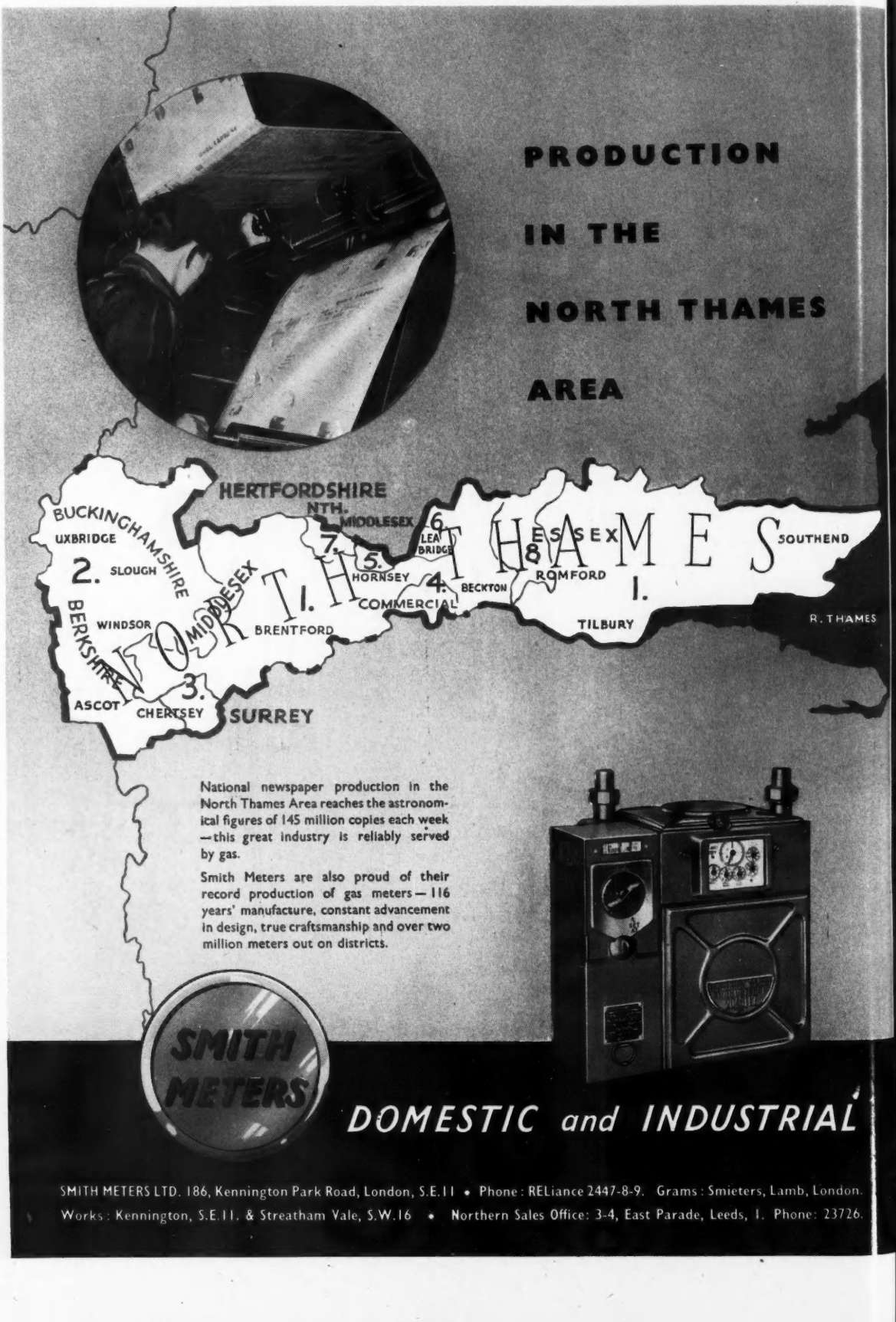
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3. The organising of visits by students to the technical departments of the Gas Board with lectures on the care and maintenance of gas cooking equipment.
4. Lectures to refresher classes for teachers of catering subjects on the care and maintenance of gas cooking equipment.

Installations in technical and training colleges are usually serviced free of cost to the education authorities, and the results are worth while. First impressions of the students are of great importance and that such impression of gas cooking equipment should be favourable is the duty of servicing and publicity departments alike.

Manufacturers of kitchen and counter equipment have the choice of gas, electricity, solid fuel, and steam with which to heat their appliances according to the application, and with the exception of a few specialist firms, they mostly market products using all these forms of heating. It is true to say that they will install a heating medium that is popular because of its many advantages in cooking and in particular is of advantage in their product. Up to now the trend has mostly been towards gas and should continue to keep that way. It is essential, therefore, to maintain the very closest relations of goodwill and common interest between manufacturers and the gas industry, for the two are complementary to each other.

Manufacturers should be invited to advise Gas Boards of the enquiries they receive for gas equipment so that the Board can assist, if necessary, in its sale. In the effort to hold the catering gas load, the gas industry stand to gain everything by close liaison with the manufacturers of kitchen equipment.

When a survey of catering establishments is made, it is noticed that some newly designed appliances are sold and installed by manufacturers and factors which are retrograde as far as approved standards of design are concerned and can only have an adverse effect on the use of gas as a commercial cooking fuel. The need to bring these manufacturers into the confidence of the gas industry is urgent as every badly designed appliance is not only vulnerable to displacement by other fuels but will prejudice other gas burning appliances owned by the caterer concerned. Future design of appliances could be carried out by manufacturers, gas industry and catering organisations planning together as far as possible so that equipment of the types most suitable to the caterer are produced. This will be a further step in consolidation against competition.

There are fourteen National Catering Associations, and the goodwill and friendship that exist between the two industries are mostly brought about by the fusing of interests with these associations.

Displays of Equipment

The permanent display of catering appliances in a central gas showroom is advisable if the catering trade is to be encouraged to look to the gas industry for assistance in the equipping of its kitchens and services. Such a display should feature the modern type of appliances of various manufacture, changing the display at regular intervals in order to give variety and to promote the products of different manufacturers.

Trade exhibitions should be approached in a different manner to the showroom. It will usually be found that when the exhibition is arranged some of the manufacturers have booked space. It is contrary to liaison and goodwill to display the products of firms not showing. On the other hand, it is of no purpose to display goods already on show, and it is suggested that the gas industry should use exhibition space to back up the efforts of the exhibitors of gas appliances and to promote the use of gas generally for the caterer, showing any new feature in application or design. In the unlikely event of none of the manufacturers showing, then the gas industry should feature appliances that will appeal to the expected type of trade visitor.

The holding of cooking demonstrations by leading chefs to members of the catering trades is excellent publicity and could be used as a means of introducing new appliances to the caterer consumers. The opportunity should be given at demonstrations to discuss problems of cooking and cooking costs with them.

The erection of large kitchens of all types is a major planning job, and the professional services of the architect, consulting engineer or catering consultant are normally called upon by the caterer. It is therefore of advantage to the promotion of gas sales if the services of the representatives are in turn offered to these planning experts. Details of appliance capacities and methods of installation, combined with the kitchen experienced gained from other caterer consumers, fuel costs, hot water requirements, and all matters that concern the person planning the kitchen and servery can be offered by the gas industry. This assistance should result in a maximum gas installation. The aim of the industry is to assist in the good planning of the commercial kitchen of the future and reference to the publication 'Planning for Industrial Catering,' first issued during the war and recently revised and issued by the Gas Council, will show how this aim is being interpreted.

Kitchen Planning

It is incumbent on the specialist sections of the gas industry to offer a kitchen planning service, thereby assuring the fullest possible gas load being installed.

It is usual for the architect to design and arrange the layout. He will normally plan the layout of the equipment himself, obtaining the information from the publications that have been written on the subject, or by direct approach to a kitchen engineer, or consultant. He may not, however, specify that gas burning appliances be installed, and the type and capacity of the equipment may not be correct. Therefore, the services of kitchen planning by the Gas Board could be of mutual benefit.

The scope of the planning service should be limited to the placing of all equipment and fittings in position giving full specifications as far as possible. The working details of the various fittings, ventilation equipment, illumination, sanitation, should be left to the architect. He will only look for guidance and help in planning the preparation and cooking of the foods. He should furnish as much information as possible providing a plan analysis, the purpose of which is to give the points that will assist in determining the layout of the kitchen and the type and size of the equipment. It is suggested that he should provide information on:

1. The available kitchen space, with plan, showing windows, main doors, goods lifts, plumbing and sanitation, the type of floor and the general colour scheme. The location of the dining rooms, staff rooms, service lifts.
2. The type of menu and the estimated maximum and minimum numbers to be catered for. Potential extraordinary work.

3. Hours of serving meals—period available for cooking.
4. Limits of expenditure.
5. The class of chef and cooks who will operate the kitchen.
6. Limitations of the layout.

The job of the representative dealing with the planning will be to decide upon the placing of equipment and fittings, having due regard to the sequence of the requirements of food through the kitchen. They are:

1. Foods reception.
2. Storage of dry food, vegetables, perishable foods.
3. Vegetables, meat, fish, poultry, pastry salad, bread, preparation bays or rooms.
4. Cooking process.
5. Dishing up and plating tables.
6. Service counter, self help, waiter service or trolley service.
7. Tea and coffee bar or kiosk.
8. Dirty plates returned to dish washing room—pot and pan wash—swill and refuse exit.

It is not intended to give details of planning kitchens for the reason that they vary according to the class of catering and the local conditions governing the property. The principles of the sequence of operations and the equipment and fittings used are applicable to most types of kitchen.

For details of kitchen planning reference should be made to the following works:

The Design and Installation of small Industrial Canteens. Paper to this Association by David G. Winslow.*

Planning for Industrial Catering. The Gas Council.

Small Canteens. Industrial Welfare Society.

The sequence may be analysed as follows:

1. *Entrance for Goods* should be spacious enough to receive daily deliveries of vegetables in bulk. The accommodation of heavy duty platform scales and checking tables or offices should be necessary with hotels, large restaurants, and large canteens.

2. *Storage of Foods* need special attention. The dry store requires adequate ventilation. Storage bins should be accessible to the main kitchen and in a position for supervision. Vegetable stores require adequate ventilation with provision for natural light control; floors and storage racks should be slatted for complete aeration of vegetables. The location should be adjacent to the preparation room. Cold room capacity should be carefully estimated. For normal storage of perishable foods an allowance of 1 cu.ft. of space per ten persons to be catered for—with large canteens and hotels and restaurants which purchase meat by the carcass and carry a stock of poultry, the recommended space is 1 cu.ft. per four persons.

3. *Preparation Rooms or Bays.*—Vegetable preparation should be near to the vegetable store. Two deep sinks, potato paring machine, and chipping machine should be installed. Benches to be erected for easy flow of vegetables from store to cooking pots and baskets. Meat and fish preparation should be located near the cold room; suggest cold slate top for fish, meat sink of glazed earthenware, fish preparation sink of slate or terazzo. Butcher's block, either free standing or integral part of meat bench preparation. Pastry preparation room should be adjacent to cold room and meat preparation. Install general-purpose mixing machine, portable flour bins cold top of marble or terazzo, tray stacking racks. Locate preparation tables between the main preparation rooms and the cooking appliances.

4. *Cooking Process.*—The equipment required will depend largely upon the type of food service—hotels and restaurants serving à la carte meals use smooth-top ranges with a small section of open boiling rings, salamanders, grills, pastry ovens, steaming ovens and stock pot stands. Hospitals use boiling pans and large roasting ovens. Small hotels and school meal centres use open boiling ring type ranges, steaming ovens. All have their special preferences and must receive full consideration.

The pattern of one kitchen of a class does not necessarily follow that of its contemporary. The sequence and layout of the large hotel and restaurant kitchen is, however, a good standard to work to as the principles laid down by this class of caterer are the outcome of many years experience and are conventional in all famous kitchens and in the hotel schools. This consists of the units of the range with open bain marie installed on an island site with service counter adjacent. The preparation rooms are grouped around the main kitchen. Pastry oven, steaming ovens are installed adjacent to them.

Good grouping can also be carried out by placing the cooking equipment against the walls. This is particularly effective in kitchens of long and narrow dimensions and is suitable for unit installation of equipment.

Another alternative in grouping is to place the appliances adjacent to the preparations which are sited in the kitchen itself. This has the advantage of eliminating unnecessary walking by the cooks.

Capacities will be governed by the amount of food to be cooked, whether the period of meal service allows for successive batches of food to be cooked and the length of service—*i.e.*, 24 hour service or main lunch meal only. Specification is obtained by taking the maximum daily requirements of the average menu and relating the findings to the rated food capacity of the appropriate appliances.

Food capacities of equipment in general use are:

Ranges and Roasting Ovens.

8-10 lb. meat per cu.ft. of oven space. Baked and oven dishes—16 portions per sq.ft. of shelf area.

Boiling Tables (Hotplates of Ranges).

Allow 1 sq.ft. of area to 3 gal. cooking pot accommodation. For small installations cooking for less than 100 persons the boiling table will be related to the oven area below.

Deep Fat Frying Ranges.

3-3½ lb. of prepared fish per sq.ft. of pan area (allow 14 minutes for loading, cooking, unloading and recovery of the heat of the cooking oil). Chipped potatoes—4.5 lb. per sq.ft. according to the method of chipping.

Steaming Ovens.

16 3-in. pudding moulds per sq.ft. of shelf, 24 portions of roll tin mould per sq.ft. of shelf.

Boiling Pans.—4 lb. potatoes per gallon of capacity. 1½ lb. shredded green vegetables per gallon of capacity.

Salamanders.—Specify according to area of dishes using this process.

Pastry Ovens.—Specify according to the size of baking trays and the class of pastry and cakes to be cooked.

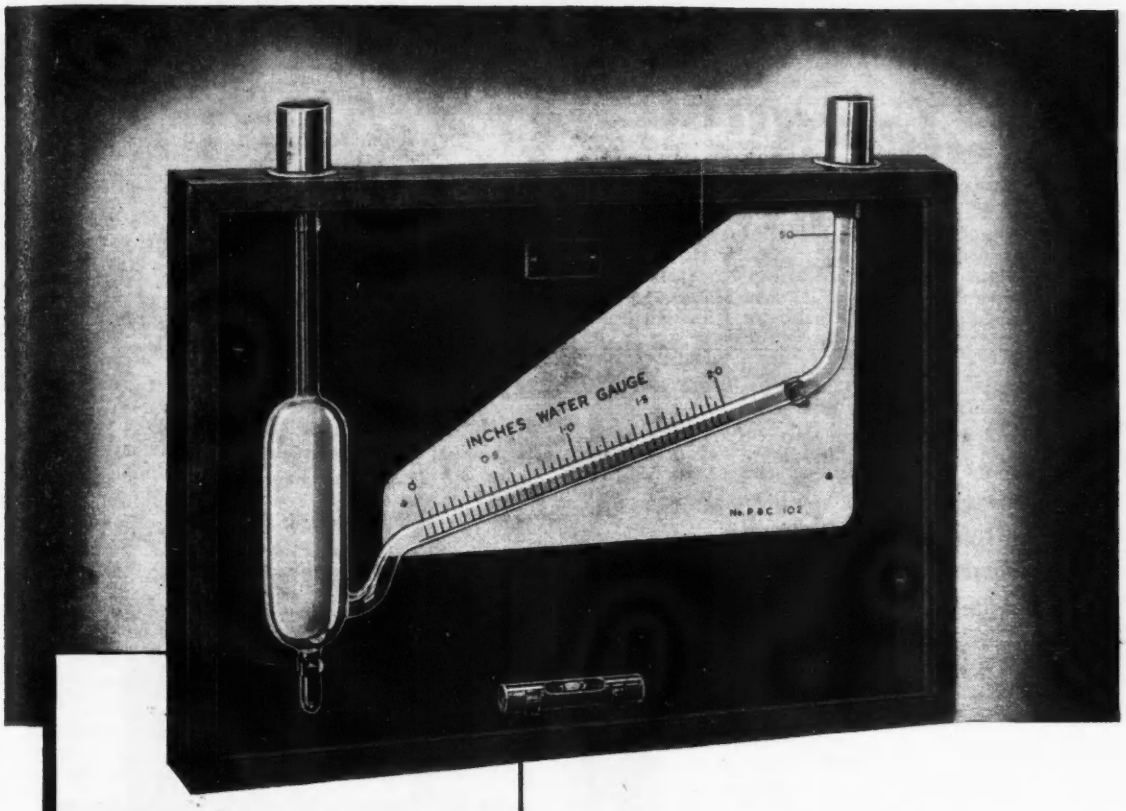
Hot Cupboards.—Calculate the capacity according to:
(1) The diameter of the plate.
(2) The thickness of the close stacked plates.
(3) The number of plates plus stacking rings for pre-plated meals.

(*e.g.*, space measuring 2 ft. × 2 ft. × 2 ft. will accommodate four stacks of 10½ in. plates with 2 in. rings plus ½ in. plate; each stack will consist of 9 plates.)

The organisation of cooking will depend upon the class of kitchen and the space available for installing the equipment. With restricted space it will be necessary to cook in relays and with adequate space, timed cooking can operate, the latter requiring more equipment than the former.

When the type and class of kitchen cooking equipment has been decided upon, consideration should be given to the finish of the equipment. As far as possible the use of vitreous enamel and plated finishes should blend in with the colour scheme of the kitchen. The lay-out of the appliance should

* See *Journal* of January 16, 1946, page 108.



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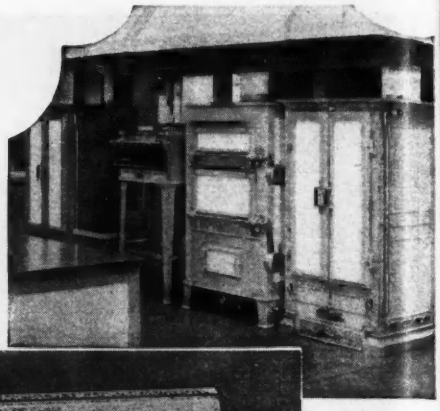

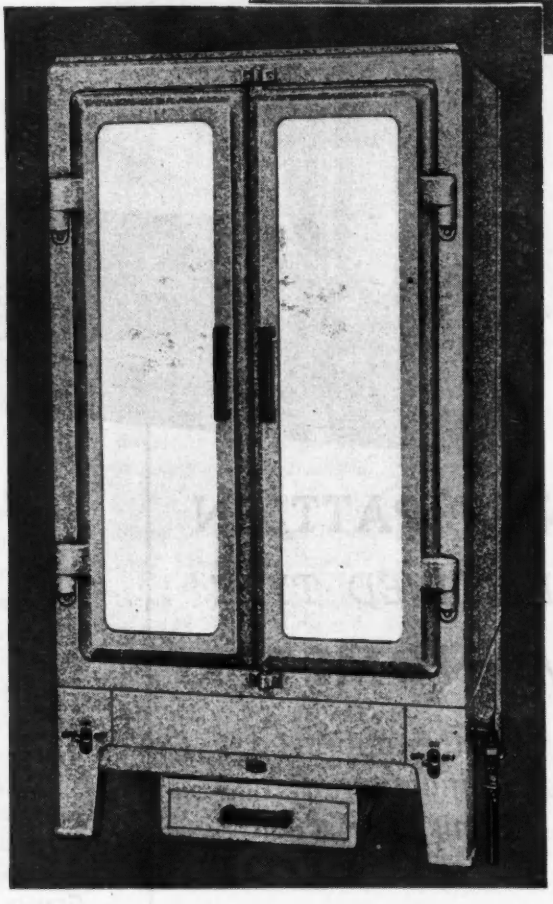

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also be judged from the elevation view in order that tall equipment does not obscure light falling upon adjacent appliances. It is also recommended that appliances be sited to give a balanced appearance.

The hot cupboards required on the service counter may be plain top or with bain marie compartments according to the type of trade. Calculate the size according to the length of hot service required—approximate estimate is 100 persons to 6 ft. run of hot counter. Allow one complete set of bain marie compartments to one barrier entrance.

There is a wide range of cafe sets and boiling water appliances, and practically all methods of tea and coffee making are featured in them. Allow 1/6th pint per person for coffee. Allow 1/6th pint per person for milk. ½ pint per person for tea. (In factory canteens the tea will probably amount to ¾ pint.)

The provision of a dishwashing machine in some establishments is an hygienic necessity and the type specified will depend upon the class of business. The immersion brush type and the immersion turbulent type have much to recommend them in the smaller canteen or the hotel and restaurant, as additional sinks are not required and the results of washing are satisfactory. With large installations the spray type will be found economical in saving time and labour costs.

One of the most important requirements of any commercial kitchen is an adequate and constant hot water supply. Its importance to the caterer can be summarised:

(1) Protection of the health of customers and staff.
(2) Attractive conditions of crockery, glass, silver and plated ware.
(3) Easing the work of the kitchen staff.
(4) Compliance with local health regulations.

Information will be required on the amount of hot water used by the caterer, and as in all matters dealing with the caterer this is influenced by the class of establishment.

The institution or school kitchen serving two courses only with a single or limited choice of food will not need the same amount of hot water per person as the luxury restaurant serving four or five courses from a well varied menu. In the first case the preparation and washing up will include two plates, four pieces of cutlery, a cup or glass per person and the amount of pans limited to the one course. In the second case it will have to include six plates and bowls, 10-12 pieces of cutlery per person and a wide range of dish covers and cooking pots with separate sinks for washing cutlery and silver dish covers.

It is estimated that hot water requirements will, therefore, vary from ½ gal. to 3 gal. per person per meal in these two cases; the remainder of the classes of catering establishments should fall within these two extremes.

Planning Recommendations

1. As far as possible work on small units of equpiment.
2. Plan adequate size passageways (4 ft. is adequate); avoid making the cooks walk more than is absolutely necessary.
3. Keep to the progress sequence as far as possible.
4. Lay-out from the elevation view as well as from the 'plan' view.
5. Do not hesitate to specify equipment that operates with electricity in addition to gas. If labour saving and efficiency are to be enjoyed to the fullest extent by the caterer, it is incumbent upon the gas industry to encourage the development and installation of cooking and ancillary appliances using gas and electricity to their respective applications.
6. Keep within the estimated cost of the work.
7. Refer to Food and Drug Act, 1938, Section 13, and to Local By-laws.

Caterers are attaching great importance to costs in general. A knowledge of running costs for the various classes of catering establishments is necessary when quoting for gas installations in competition with other fuels and also can be taken as a guide for the economical use of gas as a fuel in existing establishments.

Figures have been taken from a large number of actual installations, and they vary from very low consumptions to what must be admitted are rather high consumptions. The diversity of these figures can be explained by one of several of the following circumstances and conditions that arise.

High gas consumption can mostly be traced to:

1. Apparatus being too large for the number of meals served.
2. The meal is not so planned that the fullest use is made of the ovens and boiling tops.
3. The menu has many variations needing varied times for cooking and the occupation of additional gas burners.
4. The main meal taking two hours for the complete service, requiring the appliances to be left in part use and the continued use of hotclosets and bain marie to keep the food hot.

The continued return of low running costs for fuel consumptions does not necessarily reflect upon an efficient kitchen. A small amount of cooking equipment in relation to the bulk of food to be cooked will give an absolute minimum gas consumption per meal but may reflect adversely upon the work of the cook and the quality of food served.

The following table gives average consumptions of gas per main meal served (not including hot water supplies), and is compiled from a census collected from different parts of the country.

	B.Th.U.
Day Schools	2,000
Industrial and Commercial Cafeteria ...	3,500
H.M. Services Establishments ...	5,000
Civic Restaurants	3,500
Residential Hotels	5,000
First-Class Hotels and Restaurants ...	6,000
Popular Restaurants	5,000
Hospitals	3,500

All the above classes of kitchen cater for 200 to 500 persons. Figures in excess of 500 tend to return a lower consumption per meal. The caterer normally budgets for cooking costs as 2% of the total cost of food, and the figures quoted, with the exception of the Service Establishments, fall within that budget.

DISCUSSION

The President (Mr. **T. V. Garrud,** North Thames), opening the discussion, congratulated Mr. Williams on his paper. He was clearly a specialist at his job, and they were indebted to him for placing this information before them in a form which would be a valuable source of permanent reference. The interest which the paper had stimulated was shown by the large number present; he had counted 138—a total only surpassed by that at Mr. Buxton's paper last session. Mr. Garrud wondered whether the increase in the number of people dining out had a detrimental effect on the domestic cooking load. A number of interesting points emerged from the load curves for the industrial cafeteria, luxury hotel, and popular restaurant. He calculated that the demand could be satisfied by a smaller meter; the sizes indicated were unnecessarily large. Mr. Williams had estimated the catering load throughout the country at 100 mill. therms per annum.

In the North Thames area it was 25 mill. therms, which did not take into account those factories where the gas used in canteens was included in their overall industrial load. Finally, he considered the suggested layout of the canteen for 100 manual workers too elaborate; it must occupy nearly as much space as the factory itself.

Mr. **W. F. Moore** (South Eastern) observed that the paper surveyed the whole subject so fully that if there were enough people like Mr. Williams in the industry they would not have to worry about the catering load. It must be realised that they could not achieve their purpose by advertising alone; nor by writing letters. Much depended upon the ability of their technical representatives, who must be specialists in the subject and must be able, in addition, to speak the caterers' language. Before nationalisation only the larger gas undertakings could afford to employ a special catering representative. That excuse was no longer valid. They should now be able to offer in all spheres a specialist service second to none. They should not leave sales entirely in the hands of the manufacturers, since the gas industry itself was in a better position to advise and help consumers. Moreover, some manufacturers made appliances which used alternative kinds of fuel—and were not so vitally concerned which fuel was used so long as they could sell an appliance. The specialist representatives should join trade associations, where the pulse of the trade might be felt, and where they could meet on an equal footing those people who would be setting the fuel fashion of the future. Gas Boards would do well to encourage their representatives to join these associations (and allow them reasonable expenses to do so).

Mr. **Morris** (Benham & Sons, Ltd.) congratulated Mr. Williams on his courage in attempting to deal with so tremendous a subject in so short a time. He regarded this paper as indicating a number of headings each of which could embrace a paper on its own. Mr. Williams had referred to competition between the different fuels, and Mr. Morris agreed with all he had said on this subject. But they had not gone far enough towards improving the standard of large-scale catering equipment to meet intensified competition. A few months ago he had returned from a visit to the United States and Canada to study industrial catering there, and he would say that if the gas industry in this country had to withstand the type of competition now going on in America then 'Heaven help it.' A great deal more could be done in the way of co-operation between the industry and the appliance manufacturers than was being done at the moment.

Mr. **G. H. Barnard** (South Eastern) spoke of the importance of consolidating the catering load so as to annul the effects of competition in the future. In this there was no time to lose. Post-war design of equipment had improved, but the importance of maintenance could not be over-emphasised as this was one of the main factors in keeping the goodwill of the consumer. Too many kitchens were not receiving regular maintenance. Referring to the graphs given in the paper, he observed that the peak consumption was in each case considerably below the full-on load. The industrial cafeteria reached 67% of the full-on load; the popular restaurant, 72%; and the luxury hotel, 87%—which was well within the capacity of the meter. Mr. Barnard stressed the importance of adequate ventilation to carry away the steam vapours. The suggested complete record and history of all equipment was an immense task—highly desirable but not always practicable. One would very rarely get daily inspection of equipment by catering staff; the latter did not recognise that the equipment needed attention. The manufacturers and Gas Boards should co-operate in arranging showroom displays. The cost of a kitchen planning service need not be expensive, but it was a most desirable practice.

Mr. **Clare** (Radiation Ltd.) also contributed briefly to the discussion and after congratulating Mr. Williams on his paper emphasised the importance of liaison between manufacturer and gas undertaking before any proposals were put up to a consumer.

Mr. **E. W. B. Dunning** (North Thames) said they had been engaged with a number of makers and users in preparing a standard for catering equipment. This had involved a great deal of work, and they had now reached the stage of putting out the suggested standard for general consideration and comment. They were also preparing a film strip for use in technical schools to show students the different types of equipment available. They had tried to make the picture 'live' by showing a chef actually at work. Finally, Mr. Dunning said he had not seen much reference in the paper to steam cooking—that was, live steam.

Mr. **Barnes** (R. & A. Main, Ltd.) congratulated Mr. Williams on a masterly survey of a difficult subject. It seemed that the gas industry viewed electrical competition as something of a bogey. One was comforted by the fact that much of the gas load lost during recent years was probably due to the appliance manufacturers being unable to meet the very heavy demand made upon them—which gave electricity a big advantage. Steam was another competitive element, and business in steam equipment had risen very rapidly. The manufacturers supported Mr. Williams wholeheartedly in his insistence on the regular maintenance of equipment—but he warned members of the gas industry against the resident engineer. He was the greatest obstacle to maintaining the efficiency of appliances.

In a general discussion which followed stress was laid on the need for gas representatives to have a full knowledge of all tariffs, both gas and electricity. It was observed that the actual cooking performance of large-scale apparatus was below the standard of domestic equipment. It was suggested that special premises be set apart for the display and demonstration of large-scale catering equipment where the manufacturers could co-operate with the industry in showing the latest types of appliances.

Interest was added to the proceedings when a speaker, who said he had had a life-long experience of hospital and other catering, asserted that electricity had nothing to offer the catering industry. If the chef were consulted he would always choose gas.

Another speaker referred to the maintenance problems. It was extremely difficult to get the industry's fitters enthusiastic about cleaning appliances. The catering staff ought to undertake the simple cleaning. Another important factor in maintenance was the quick and adequate supply of spare parts. It was observed that running costs were of little interest to the average catering staff. It was therefore desirable to put all main controls out of reach, while adjustable controls should be removed altogether. This would be the best trend of future design. It was remarkable that there had been no mention in the paper of gas refrigerators of larger size for catering.

A speaker who described himself as a 'small caterer' had some pertinent observations to make as a result of his experience of a solid fuel range—presumably of the heat storage type. In relation to an increase in main meals served of 154%, the fuel costs had risen by only 6.5%. The fuel cost per main meal before the installation of this new range was 1.88d. and after, 0.79d.—a reduction of 58%. This included the whole of the fuel used for all purposes. The extra labour in stoking and cleaning was negligible. It was much easier to clean than the grills and frets of a gas range, but he had to admit that gas or electricity was better for grilling and toasting. Moreover, 'contact' utensils were necessary for full efficiency.

The Author briefly replied to the discussion, and a hearty vote of thanks was accorded him on the proposition of Mr. **L. F. Randall** (South Eastern).

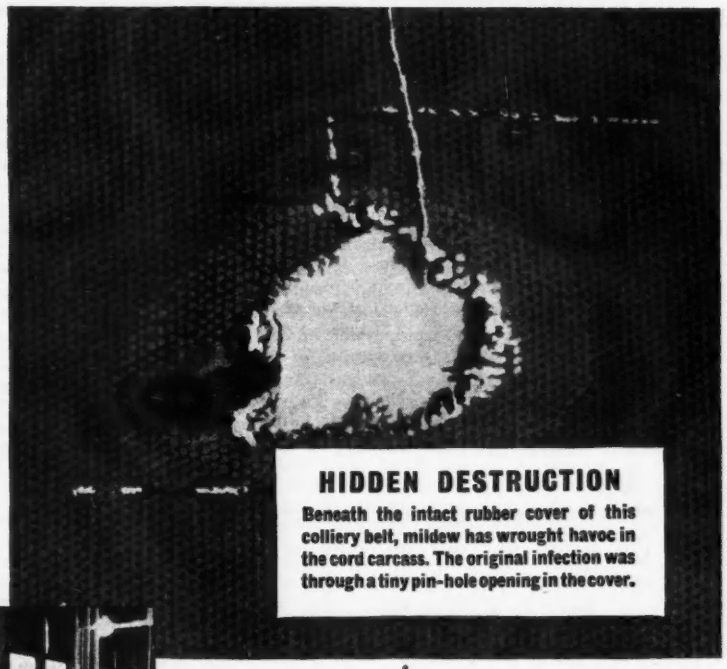
CARBON STEEL CASTINGS

The British Standards Institution has recently published B.S. 592 : 1950, 'Carbon Steel Castings for General Engineering Purposes.' This standard is a revision and an extension of the 1940 edition and provides a comprehensive range of carbon steel castings for engineering purposes, including the construction of ships, marine engines and railway rolling stock, and replaces B.S. 24, Part 4, Specification No. 10. The three grades of castings differ from those in the 1940 edition in that they are of 28, 32 and 35 tons per sq.in. minimum ultimate tensile stress, and full chemical composition is specified for all grades. Inspection and testing is covered in detail and an appendix gives recommendations on the repair of castings by metal-arc welding. Copies of this standard may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, S.W.1, price 2s., post free.

MILDEW was a menace

PIONEER WORK BY GOODYEAR RESEARCH TEAM CONQUERS DEADLY BELT-DESTROYING FUNGUS

Mildew has always been the arch-enemy of conveyor belting — the cancerous infection that, beneath a belt's perfectly intact rubber cover, can reduce the cord duck to soft pulpy ruin in the course of a few months. The reason for this is that the mildew spore flourishes in the very conditions in which conveyor installations often work—darkness, dampness, lack of ventilation, uniform and moderate temperature, and during prolonged periods of idleness — as in day-shift-only factories and seasonal sugar-beet refineries.



HIDDEN DESTRUCTION

Beneath the intact rubber cover of this colliery belt, mildew has wrought havoc in the cord carcass. The original infection was through a tiny pin-hole opening in the cover.

Isolating the Fungicidal Agent

These Chemists, working in one corner of the huge Goodyear Laboratory, succeeded, after months of painstaking effort, in isolating the only agent yet discovered that inhibits the development of the mildew spore.

Obviously, the conditions in which conveyor belts work are unlikely to change, so the problem could only be solved by the discovery of a mildew inhibiting agent. In the absence of any officially sponsored work, the Goodyear Company undertook the work themselves as part of their normal service to clients. They gave their research chemists the task of isolating a fungicidal agent with which to treat the cord plies of all their belts, to protect them from the ravages of mildew infection. After long months of experiment this was done. The next task was to give the fungicidal agent a thorough test, in all operating conditions and on all types of belting. This, too, required many months of patient work by the Goodyear scientists; but, here again success crowned their efforts. It was proved conclusively that the new fungus-defying agent was completely effective in all circumstances. Since then, every Goodyear belt has been impregnated with this inhibiting agent as a normal part of production routine. As a result, every Goodyear belt installation is impervious to attack by mildew, and can be relied upon to give long trouble-free service.

ANOTHER OF NATURE'S HOSTILE FORCES HAS BEEN CONQUERED BY

GOODYEAR

INDUSTRIAL RUBBER PRODUCTS

THOUGHTS ON THE COKE MARKET*

By H. L. G. BOOT, B.Sc., F.R.I.C., M.Inst.Gas E.,

Chief Chemist, Bournemouth Group, Southern Gas Board

A SURVEY of the production and consumption figures of various fuels is revealing. Table 1 shows the production of coal, coke, gas, and electricity.

TABLE 1.
Fuel & Power Production
(Great Britain)
(Great Britain)

Fuel/power	1938	1949
Coal, mill. tons	227	215
Coke (*a*), mill. tons	20.04	25.32
Gas (*b*), mill. therms	1,659	2,483
Electricity, M.kW.h.	24,372	49,115

Notes.—(*a*) Coke used on gasworks not included. (*b*) This represents the total gas available at gasworks.

If 1938 is taken as the year of comparison, we find that in 1949 production of coke was 126% of the 1938 level and of gas and electricity 150% and 202% respectively. An increase in population of 6% occurred over these years and, therefore, the production figures per head of population become 119% for coke, 142% for gas, and 190% for electricity. These are remarkable increases for gas and electricity and a modest increase for coke, but even this modest percentage increase is greater than that for inland consumption of coal. Gas, coke, and electricity have, in fact, all gained at the expense of coal.

A breakdown of the inland consumption of coal and coke, as shown in Table 2 reveals the changes in the consumer groups.

TABLE 2.
Inland Consumption by Consumer Groups.

Group	Coal 1938 Mill. tons	%	Coal 1949 Mill. tons	%	Coke 1938 Mill. tons	%	Coke 1949 Mill. tons	%
Domestic and non-industrial ...	45.8	26	30.8	16	6.14	29	7.75	27
Industrial (*a*) ...	132.2	74	164.7	84	15.10	71	20.71	73
Total	178.0	100	195.5	100	21.24	100	28.46	100

Note.—(*a*) Includes public utilities, cokeries, and collieries.

For every consumer group in which both coal and coke are used, the proportional increase in coke consumption is greater than that for coal. The most notable change of all is in the domestic field where coal consumption is 67% and coke consumption 126% of the 1938 level.

The 47% increase since 1938 of the coal consumed by gas, coke, and electricity producing plants has resulted in increased production of (a) gas by 50%, (b) coke by 26%, and (c) electricity by 102%. If allowance is made for the increased quantity of coke consumed by blast furnaces, the increase of coke available for sale becomes 21% above the 1938 level.

The actual thermal increase in production from 1938 to 1949 was (a) 824 mill. therms as gas, (b) 848 mill. therms as electricity and (c) 1,480 mill. therms as coke. I stated earlier that the coke increase was modest, but when viewed on a thermal basis it assumes some importance.

The expansion since 1938 of domestic coke sales is all on the gas coke side. Of course, rationing of solid fuels and the large increase in price is responsible for the decrease in consumption of domestic coal, and consumers have turned to the unrationed fuels, gas and electricity; it will be interesting to see what will happen now that coke is also unrationed.

It may perhaps be argued that the gas industry would have difficulty in meeting an excess demand for coke, and this would no doubt be true if an increase in availability of about 4 mill. tons in one year were contemplated. However, it is of interest that, if an extra 2.2 mill. tons of coal had been carbonised at gasworks in 1949 and water gas production restricted to 10% of the total gas made instead of 17%, the same amount of gas would have been produced and an additional 1.6 mill. tons of coke made available. This would have represented a 17% increase in gas coke availability and, at the same time, could have reduced the consumption of domestic coal by 2.2 mill. tons since 1.6 mill. tons of coke, when burnt in an open coke grate, is equivalent in performance to about 2.2 mill. tons of coal in an open coal grate.

The increased domestic demand for gas and electricity has put a strain on the producers, since this demand is at peak periods over certain months of the year. The space heating gas and electricity loads cannot be increased much more without undue capital expenditure, and such an expenditure cannot be in the national interest if it means reducing the average load factor still further in order to supply energy for space heating. It follows, therefore, that solid domestic fuel must remain a feature of the British household, and it seems to me that it is our duty to induce the public to burn smokeless fuels, such as coke, rather than coal. We must, however, first of all believe ourselves that coke is a satisfactory fuel for domestic purposes. I am astonished at the number of people employed in the gas industry or in distribution of coke who themselves burn coal.

It must, of course, be admitted that there are difficulties associated with the production of a good quality gas coke. One is that some producers have, in the past, regarded gas as the main product and coke very much as a by-product, with the result that gas has had most attention and coke very little. To my mind this is a most unfortunate attitude, especially now that coke is unrationed.

To my mind, grading is the most important property of a good coke. If broken coke should be supplied for a particular job such as an open coke fire, then let it be broken and not mainly nut coke or breeze. The coke sizing survey which is being conducted in 100 gasworks throughout the country should give valuable information about the sizes which are produced and about the uniformity of these sizes. And here I must stress to my sales friends that large scale grading of coke is not easy. In some plants the wear and tear of screening plates is enormous, such plates having to be renewed every few weeks because the holes have worn to a much larger size. Then, after passing the screens, the coke falls into hoppers where some breakage is bound to occur and, unless final de-breezing screens are supplied, all this breakage passes to the consumer. One frequent trouble is that breeze and dust, formed from the moving coke in a hopper, tend to settle at the sides and only fall out when the hopper is nearly empty. Designers of new plant should bear this in mind when considering the shape of hoppers.

In connection with the grading of coke, it should be mentioned that a forecast of the quantities of each grade available for sale can only be made very approximately. The type of coal received for carbonisation has a considerable bearing on the strength of the coke produced and it is possible for a run-of-retort gas coke to contain only 15% above 2 in. one day and 65% the next day.

Over the past three years in Bournemouth our sales of coke (other than breeze) have averaged 25% large, 45% broken, and 30% nuts.

A wet coke is most undesirable since, apart from the fact that the consumer considers he is being swindled if he can see it is wet, it is more likely to be the cause of shale explosions. Furthermore, if the coke is excessively wet it will not ignite readily.

A high ash content is obviously undesirable and this is,

* From a paper to the Coke Sales Circle of the London and Southern Counties Coke Division, of the Gas Council Coke Department.

unfortunately, more or less outside the control of the coke producer. As is well-known, the ash content of coal has been creeping higher and higher in recent years, and we can only hope that the National Coal Board's promised coal cleaning plants will improve the situation. The ash content as normally understood is not the only trouble, the volume of ash being a very variable factor. For the same percentage of ash in two different cokes, the ash volume of one coke can be twice what it is in the other.

The final volatile matter content of coke depends on the extent to which carbonisation of coal has been carried and with gas coke it is usually about 2%. If the volatile matter is too low, coke will not ignite so readily.

Only grading, moisture, volatile matter, and, to a certain extent, critical air blast are under the control of the producer, and the most difficult property to keep within reasonable limits is grading, which is at the same time probably the most important.

Handling and storage of coke can also cause difficulties in the production of a good-quality fuel. It is not of much use having a well graded coke from the screening plants if this coke is transferred to another depot in such a fashion that further undue breakage occurs. With some cokes, very careful handling is required and even then debreezing at the storage depot might be necessary.

Coke which has been charged into a vertical retort after scurfing takes up graphitic carbon and is unsuitable as a domestic fuel. A consumer who receives such coke is likely to turn to other fuels.

Coke Marketing Problems

A difficulty associated with marketing gas coke is the competition that exists between gas and coke on the one hand and coal and coke on the other. I feel that some gas salesmen are perhaps confused about gas and coke competition and tend to boost gas for a purpose which might just as well, or better, be served by coke. I have already explained that space heating by gas cannot be increased indefinitely and that it is a mistake, both from the point of view of the national economy and from that of the gas undertaking concerned, to adopt a policy of 'gas fires only.' There are exceptions to this statement—namely, where the industrial demand for gas is in excess of the availability. In such a case, new gas production plant could perhaps be installed so that both increased industrial and space heating demands could be met without reducing the load factor. It must be obvious that the gas industry and the nation cannot afford to have too much plant —even water gas plant—standing idle for several months of the year.

The consumer, of course, has the final word, and it cannot be denied that, as a nation, we like to have an open fire in at least the living room with perhaps gas or electric fires in other rooms. The point I wish to make is that something like 31 mill. tons of coal is used annually for domestic and non-industrial purposes compared with about 7¼ mill. tons of coke, and that the gas salesman should boost coke as against coal in the open fire. He should display coke appliances actually working in an attempt to capture some of the coal market. The gas salesman would naturally boost gas fires for occasional rooms.

So far as domestic central heating is concerned, either as background or total space heating, coke is the fuel that should, as a general rule, be recommended.

I have tried to indicate that, so far as integrated gas and coke sales staff are concerned, there need be no confusion in their minds about competition between gas and coke since, for the average household, this competition does not exist so far as space heating is concerned, but that rather it would be in the national interest for the salesman to concentrate on the real competition that exists between coal and coke.

A fuel policy has to be decided upon, and if this policy envisages the importation of large quantities of gas oil for gasification in water gas plants, involving absorption of graded coke in addition to large coke, then there would not be much point in having a coke sales campaign. It is, therefore, essential that the Government's fuel policy should maintain a proper balance between coke and gas and that once such a policy has been made, it should be adhered to for a reasonable length of time. One of the features of the post-war world appears to be that one plan replaces another almost before the forerunner has been tried out.

The gas industry should produce an attractive smokeless solid fuel, and in my view it is high time we gave the matter more attention. Gas undertakings are under a legal obligation to supply gas of a certain quality, and officially appointed examiners exist to see that this is done. Why is it that coke is not subject to a quality control? I know that this matter has been considered before and that many people have agreed that quality of coke should be given more attention, but the time has surely come for action to be taken. It is of little use to recommend a coke specification to an undertaking unless there is some force or incentive which obliges that undertaking to follow the specification. Past experience shows that full attention will be given to those products which one is bound to sell at a certain quality, but when there is no such obligation usually the products receive secondary consideration.

A number of methods could be used to enforce a satisfactory standard of coke quality but I would first of all frame a specification round the moisture content and grading, since these are properties which are solely in the hands of the producer. A specification involving an actual performance test in a boiler or open fire is not, to my mind, immediately advisable, since we must keep our feet on the ground and realise that many undertakings do not have sufficient technical personnel for such work.

In framing a specification, the main thing to bear in mind is that consistency of coke quality is all-important, and one method of control might be similar to that employed for calorific value of gas—namely, each undertaking could declare that its graded coke averaged so much per cent. of the standard size, but the variation around the average would be fixed by the controlling authority, and if an undertaking exceeded the limits of variation then a rebate would be made to the consumers of that grade of coke. Similarly for moisture control.

A preferable method might be for each producer to endeavour to make graded coke according to standard sizes and a specified moisture content, with a reasonable variation around the mean figures, and to those undertakings which manufactured the correct grades a bonus would be paid, this bonus to come from a fine on the undertakings which did not produce the specified coke.

Unfair to Small Undertakings?

It will perhaps be argued that a system of coke quality control involving penalties would be unfair to some very small undertakings where no coke grading is done. However, it must be remembered that both small and large undertakings are now the responsibility of area gas boards, and the larger and more efficient gas coke producers should be able to help their smaller brethren. In the area of the Southern Gas Board, for instance, arrangements are being made to transfer coke from small works, where efficient screening is not possible, to more efficient screening plants on other works.

An improved, guaranteed coke would, I feel sure, be welcomed by the public especially if modern selling technique and new ideas were used. I read recently that a firm in Holland brings its customers their coke in aluminium bins; apparently the customer can order one or more of these bins, for which no charge is made, to be delivered daily as required—with the milk and morning paper! It is a suitable arrangement for flats where no storage is available. Incidentally, in Holland coke is produced in seven standard sizes, which are imposed by the Gas Association, representing gas-works and coke ovens. Coke is tested for quality by a body known as T.N.O. or Applied Physical Research; the ash content may not exceed 12% and moisture 5%.

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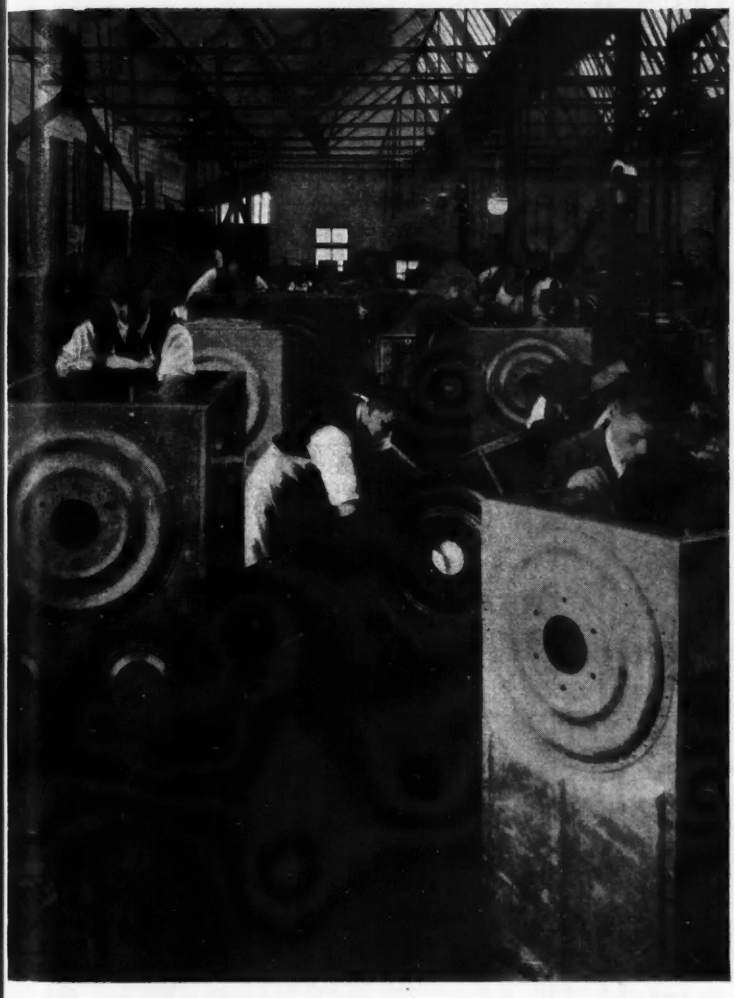

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Emigration 1850

EMIGRATION.—Vessels which are to leave London Docks for Australia, New Zealand, and Port Natal shortly are expected to carry 1300 emigrants to these countries. With regard to women wishing to emigrate overseas, the report of the Female Emigration Fund Committee states that more needlewomen are not particularly wanted because they would be unsuited to the colonies, and are, generally speaking, making fair wages here. The shop-workers, and those engaged in coarse work, will not be taken unless they can cook or wash or act as domestic servants in some capacity.

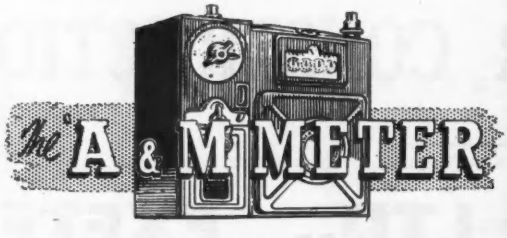
THE CHARLEWITCH STAKES.—An intimation has been received from the Russian Consul-General that the annual donation of his Imperial Highness the Grand Duke Cesarewitch will henceforth be discontinued. It is the intention of the stewards to recommend [illegible] that the Cesarewitch [illegible]

Excerpt from "THE SCOTSMAN" 1850

IT would appear that at all times the colonies have been more or less particular concerning the capabilities of intending immigrants.

Whilst we cannot subscribe to the oft repeated theory that the best technicians of our Country have sought their fortunes overseas, we cannot deny our pride and admiration for the foresight and pioneering instincts of our forebears whose technical skill and business acumen opened up and developed the overseas markets.

We salute that width of vision and abundance of energy which in the past 100 years has made the "A. & M." Meter available to many lands.



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Dunstable, Beds.
Specialists for over 30 years
Annual production over 700,000 cranks

SPECIALISTS in ERECTION, DISMANTLING, ETC., GAS PLANT, GASHOLDERS, PURIFIERS, FACTORY BUILDINGS, SHEETING, GLAZING.
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BARCLAYS BANK CHAMBERS, OWEN STREET, TIPTON.
Telephone: TIPTON 1958. STAFFS.

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
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CONTRACTORS FOR GAS MAINLAYING
'Phone: TIPTON 2161 'Grams: "PIPELINES" (5 lines).

CRANE
LTD

PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/-; by post 1/2d.

NEW SUBSCRIPTION and CLASSIFIED ADVERTISEMENT RATES OPERATING FROM JAN. 1, 1951.

Subscription Rates: Home and Empire :- 52/- per annum; Foreign :- 60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS OFFICE: 10, Union Street, Birmingham.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone: Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

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APPOINTMENTS VACANT

WALES GAS BOARD

PORT TALBOT UNDERTAKING.

DRAUGHTSMAN.

APPLICATIONS are invited from suitably qualified persons for the following position:

An ENGINEERING DRAUGHTSMAN experienced in the work of a general drawing office and qualified to prepare the necessary designs, drawings, specifications and estimates in connection with new gasworks plant.

The successful applicant will be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt in the future.

The salary offered will be commensurate with experience.

Applications, accompanied by two references, should reach the undersigned not later than January 2, 1951.

W. F. EDWARDS, F.C.I.S.,
General Manager and Secretary.

Port Talbot Gas Undertaking,
18, Station Road,
Port Talbot.

WALES GAS BOARD

NEATH UNDERTAKING.

APPLICATIONS are invited for the appointment of DEPUTY ENGINEER AND MANAGER of the Neath Undertaking.

The annual output of the undertaking is at present approximately 720 mill. cu.ft. Substantial increases in demands are anticipated.

The successful applicant will be required to be responsible to the Engineer and Manager for the efficient operation of the works, to perform those duties in the Distribution and Administrative Departments normally associated with the appointment of Deputy Engineer and Manager, and, in the absence of the Chief Officer, to be responsible for the management of the undertaking.

Applicants must possess, as a minimum, the Higher Grade (Manufacture) Certificate of the Institution of Gas Engineers. A similar attainment in distribution will be an added advantage.

Experience of continuous vertical retorts and of carburetted water gas plants is essential.

The salary will be within the range £595-£720 per annum, the commencing salary to be dependent upon the qualifications and experience of the successful applicant.

Applications, giving age, details of qualifications and experience, and the names of two referees, should be submitted to the undersigned so as to be received not later than December 27, 1950.

G. FITTON, B.SC., M.INST.GAS E.,
Engineer and Manager.

Wales Gas Board,
Neath Undertaking,
The Gasworks,
Neath,
Glam.

REPRESENTATIVE.

LEADING manufacturers of gas meters require experienced REPRESENTATIVE for East Midlands, Yorkshire and the North. State details of past experience, age, education and other relevant matter. Successful applicant will be required to contribute to the Company's pension scheme.

No. 9940, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

FIRST-CLASS DESIGN ENGINEER (over 30) wanted to take charge (under Chief Engineer) of schemes and estimating department for well known firm of gas engineering contractors. Coal and coke handling experience of primary importance.

Write in confidence, stating age, training and experience in chronological order, and salary required, &c., to No. 9941, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

WEST MIDLANDS GAS BOARD

WELLINGTON DISTRICT.

WORKS SUPERINTENDENT.

APPLICATIONS are invited from suitably qualified persons for the above appointment. Candidates should be thoroughly conversant with all aspects of gasworks practice and have experience in vertical retorts, C.W.G., purification and by-products plant and the control of employees. The possession of the Institution of Gas Engineers Higher Grade Certificate in Gas Engineering (Manufacture) will be an essential qualification.

Salary will be within Grade IX, A.P.T. (£520-£620 per annum) according to qualifications and experience. A house (on rental) will be provided.

The successful candidate will be required to pass a medical examination and the appointment will be subject to any superannuation scheme which the Board may introduce.

Applications, stating age, qualifications and experience, details of present and previous appointments, and giving the names of two referees, should be addressed to Mr. C. M. D. Belton, Divisional Manager, Shropshire Division, Sidney House, School Court, Shrewsbury, within 14 days of the appearance of this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WALSALL AND DISTRICT DIVISION.

APPLICATIONS are invited for the post of WORKS CHEMIST to the South Staffordshire Mond Undertaking, Dudley Port, Tipton.

Candidates should be qualified and preferably have had experience of large gasworks practice, and a knowledge of modern boiler plant and feed water treatment will be an advantage. The person appointed will be responsible for the chemical control of the plant, and will have adequate assistance for routine work.

The salary will be within the range of Grade VIII of the Salary Scales of the National Joint Council for Gas Staffs, £490-£570.

The appointment will be subject to such superannuation regulations as may be made in due course, and the successful candidate may be required to undergo a medical examination.

Applications, stating age, qualifications and experience, accompanied by the names of two referees, are to be sent to Mr. E. Hardiker, Divisional Manager, Walsall and District Division, Walsall Factory Estate, Tame Bridge, West Bromwich Road, Walsall, not later than 14 days after the appearance of this advertisement. Applicants are requested to quote reference T.P.3 when replying to this advertisement.

F. H. CURETON,
Secretary.

(Classified advertisements continued on Supplement 4)

APPOINTMENTS VACANT (ctd.)

SOUTH EASTERN GAS BOARD

EAST SURREY DIVISION.

CHEMIST AND TECHNICAL ASSISTANT
HORLEY WORKS.

APPLICATIONS are invited for the above-mentioned position.

Applicants should have had experience in the control of manufacturing plant and the necessary chemical training and experience to enable them to carry out the usual routine gas tests.

The salary will be within the range of £370-£480 per annum according to qualifications and experience.

Applications (quoting reference V10/111), giving details of service in the gas industry, age, present occupation, experience and qualifications, &c., should reach the undersigned not later than December 23, 1950.

R. J. McCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SCOTTISH GAS BOARD

EDINBURGH GROUP.

TECHNICAL ASSISTANT.

APPLICATIONS are invited for a vacancy as TECHNICAL ASSISTANT at the Granton Works of the Edinburgh Undertaking.

Candidates are required to possess the Higher Grade Certificate in Gas Engineering (Manufacture) of the Institution of Gas Engineers or an equivalent qualification.

The position calls for experience in the technical control of gasmaking and ancillary plant.

The salary scale will be A.P.T. VII, Provincial 'A', £450, rising to £530 per annum, and placing on the scale will depend on qualifications and experience.

The successful candidate will be required to pass a medical examination and will be subject to the provision of any superannuation scheme which the Board may introduce.

Applications, stating age, training, qualifications and experience, accompanied by *copies* of not more than three Testimonials, should be made to the undersigned not later than the first post on Saturday, December 23, 1950.

DAVID BEAVIS,
Group Manager.

15, Calton Hill,
Edinburgh, 1.
December 1, 1950.

EAST MIDLANDS GAS BOARD

NOTTS AND DERBY DIVISION.

DERBY UNDERTAKING.

INDUSTRIAL GAS ENGINEER.

APPLICATIONS are invited from suitably qualified persons holding Higher Grade Certificate in Gas Engineering (Supply) for the appointment of INDUSTRIAL GAS ENGINEER in the Derby Undertaking.

The salary offered for the post is in accordance with A.P.T. Grade XII of the National Scales for Salaries (£645-£770).

Candidates must have a sound knowledge of combustion and utilisation of industrial and commercial gas, particularly as applied to heavy industry.

The successful applicant will be required to pass a medical examination and the appointment will be subject to such superannuation scheme which may be adopted by the Board.

Applications, stating age, qualifications and experience, together with details of present and previous appointments and giving the names of two referees, should be addressed to the undersigned to reach him not later than December 29, 1950.

K. L. PEARCE,
Divisional General Manager.

7, Friar Gate,
Derby.
December 7, 1950.

DRAUGHTSMAN required with sound knowledge of gasworks and coke ovens by-product work and allied chemical plant design. Age 30-35. Permanent position to suitable applicant who must be of section leader or equal status. Must be capable of working on own initiative. Commencing salary £550-£600 per annum according to ability. Apply by letter to GEORGE ROYSTON & SON, LTD., Chemical Engineers and Leadburners, Winter Grove Works, Barnsley, Yorks.

NORTHERN GAS BOARD

MIDDLESBROUGH DIVISION.

GAS SALESMAN.

APPLICATIONS are invited for the appointment of a GAS SALESMAN for the Middlesbrough Unit.

Salary will be in accordance with the N.J.C. Scales for Gas Staffs, Provincial 'A', Grade 'C', maximum £440 per annum, placing according to qualifications and experience.

Applicants should have had experience in salesmanship and office records. The successful candidate will be required to pass a medical examination and to subscribe to such superannuation scheme as may be adopted by the Board.

Applications, endorsed 'Gas Salesman,' giving details of age, qualifications and experience, together with the names of two referees, should be sent to the undersigned not later than December 27, 1950.

JOHN W. PALLISTER,
Divisional General Manager.

Gasworks,
Commercial Street,
Middlesbrough.
December 4, 1950.

NORTH WESTERN GAS BOARD

COKE DEPARTMENT.
DEPUTY COKE OFFICER.

APPLICATIONS are invited from suitably experienced persons for the position of DEPUTY COKE OFFICER.

The person appointed will be required to assist in the organisation, co-ordination and development of the sales of coke throughout the North Western Area and to deputise in the absence of the Coke Officer.

The salary will not be less than £850 per annum.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt in the future.

Applications, furnishing personal details, together with present salary, qualifications and experience and giving the names of two referees, should be forwarded to the undersigned not later than 14 days from the publication of this advertisement.

Please endorse applications, "Deputy Coke Officer," in the top left-hand corner of the envelope.

S. G. Deavin,
Secretary.

Bridgewater House,
60, Whitworth Street,
Manchester 1.

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CENTRIFUGAL PUMP, 164 g.p.m., 65 ft. head, 400/3/50.

Three throw VERTICAL PUMPS, 5 in. by 8 in., 5 in. by 6 in. and 3¼ in. by 5 in. stroke.

Two Phoenix COKE CRUSHERS, types 21/11 and 12.

Twenty h.p. DIESEL LOCO, 24 in. gauge.

'Ideal' and 'Industrial' H.W. RADIATORS and H.W. CYLINDRICAL AND SECTIONAL BOILERS.

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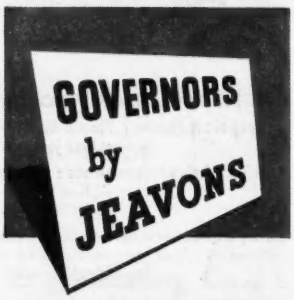
WANTED. SPARE PARTS urgently required for Parkinson & Cowan Wet Meters, all sizes 21t-201t, new or good used condition. Full particulars to No. 9939, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.



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(British made) CLASS A
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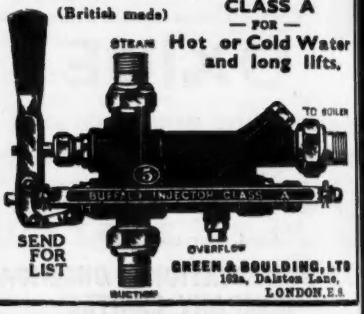

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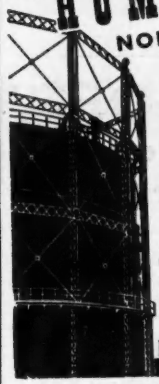
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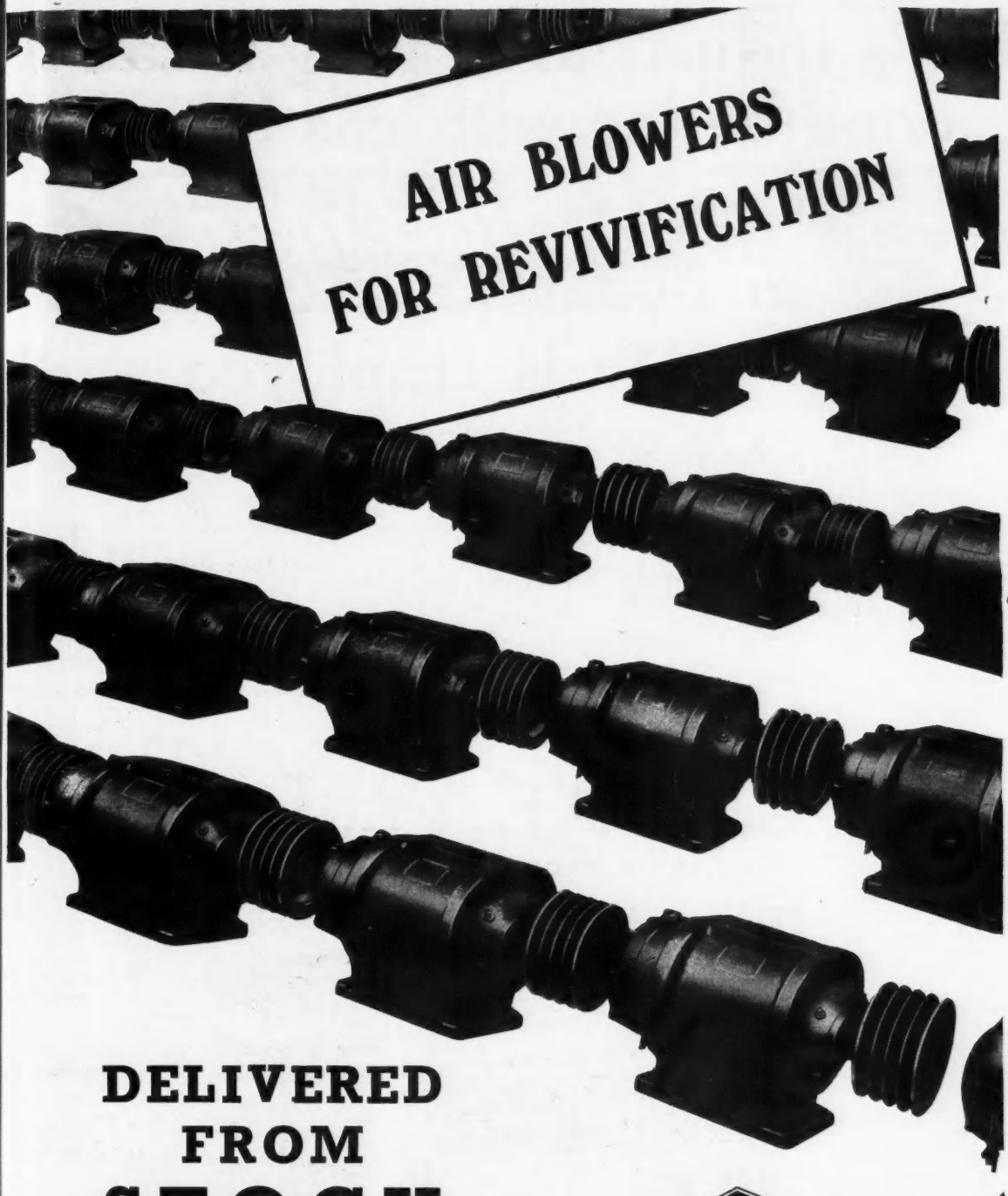

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"KEITH-BLACKMAN" Industrial Gas Heating Equipment includes: High and Low pressure Gas Injectors, Burners and Nozzles for almost every industrial heating process; Brazing Blowpipes; Soldering Irons; Soldering Stoves; Air and Gas Mixture Controllers; Thermostat Temperature Controllers; Back-pressure Valves; Meter Protection Valves; Pressure Governors; Gas Compressors; Air Compressors and Safety Shut-off Valves.

The illustration shows part of industrial heating equipment applied to gum running furnaces.

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When it is an industrial heating problem always consult

KEITH BLACKMAN LTD., MILL MEAD ROAD, LONDON, N. 17. IT.N.: TOTTENHAM 4522. T.A.: KEITHBLAC, NORPHONE, LONDON

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Cast Iron Purifiers temporarily erected in our Works prior to despatch

Specialists in TANKS, Steel or Cast-Iron, Riveted or Welded, etc.
JAMES BRIDGE WORKS, DARLASTON

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Editorial in the "GAS JOURNAL" of July 28, 1948, p. 205

WEST'S GAS

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Columbia House, Aldwych, W.C.2

SYDNEY OFFICE:
Union House, 343 George Street

NEW YORK OFFICE:
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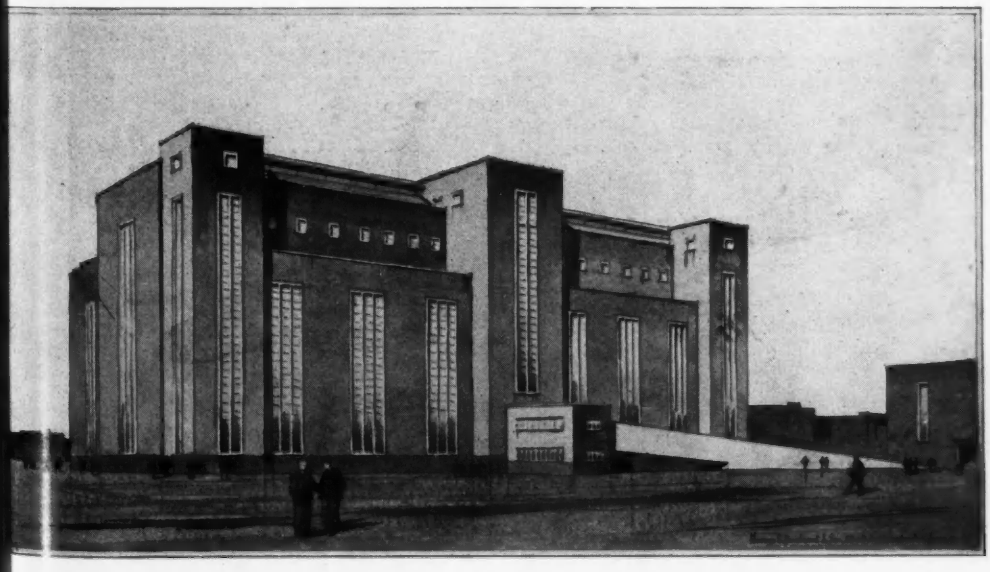
ALBION IRONWORKS · MILES PLATTING · MANCHESTER



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"... we have each of us a trade and are in our proper position when exercising it..."

Wellington's reply to Canning in 1827 when asked to become Prime Minister.

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